Sustainable Neighborhoods
& LEED Neighborhood Development

Seattle, Washington

August 8, 2005

FARR ASSOCIATES

Architecture | Planning | Preservation

Farr Associates

Designing Sustainable Human Environments

Planning

Urban Design

Architecture

Preservation

FARR ASSOCIATES

Architecture | Planning | Preservation

What is a sustainable human environment?

Savannah, Georgia

FARR ASSOCIATES
Architecture | Planning | Preservation

200 Years of Human Settlements

(8 minutes)

FARR ASSOCIATES

Architecture | Planning | Preservation

Sustainable Non-Human Habitats

Traditional (Pre-Industrial) City

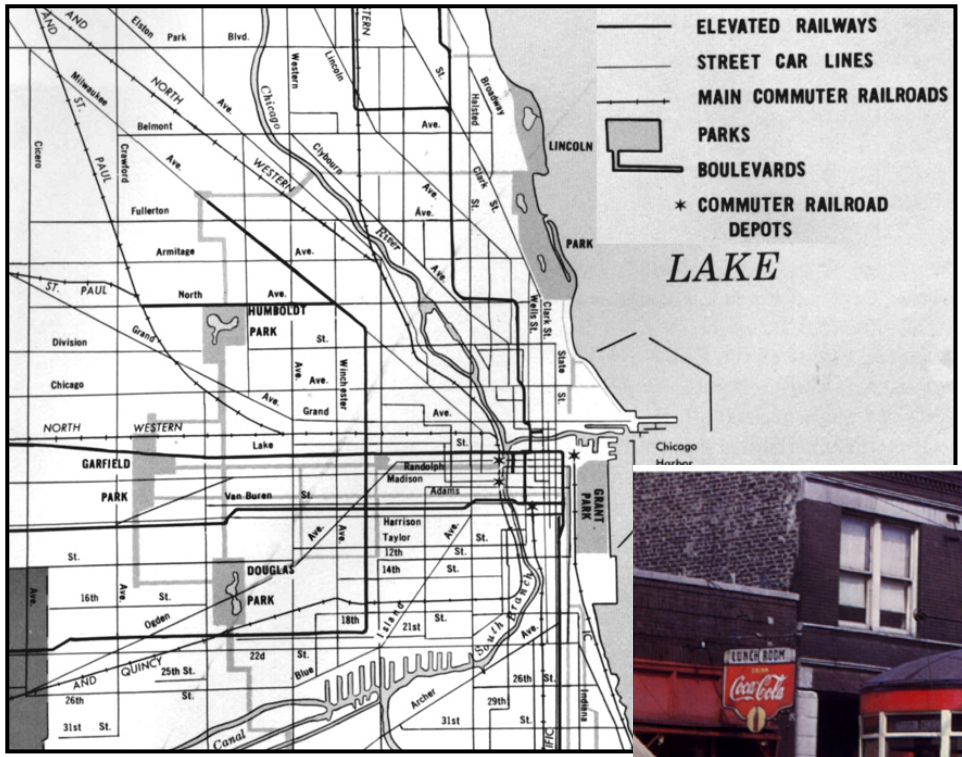
Colonial america

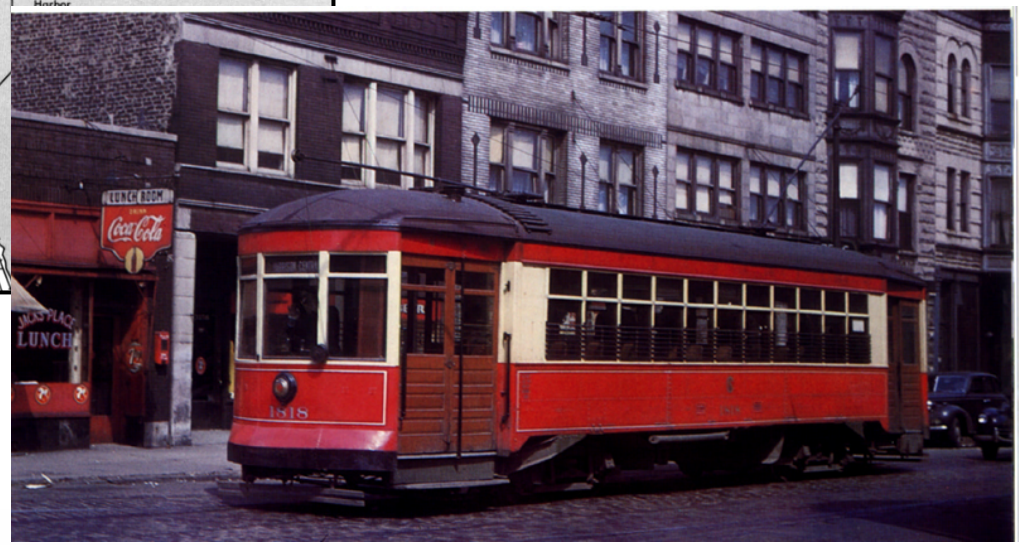
FARR ASSOCIATES
Architecture | Planning | Preservation

19th C. Industrial City

FARR ASSOCIATES
Architecture | Planning | Preservation

Urbanism co-evolved with Transit



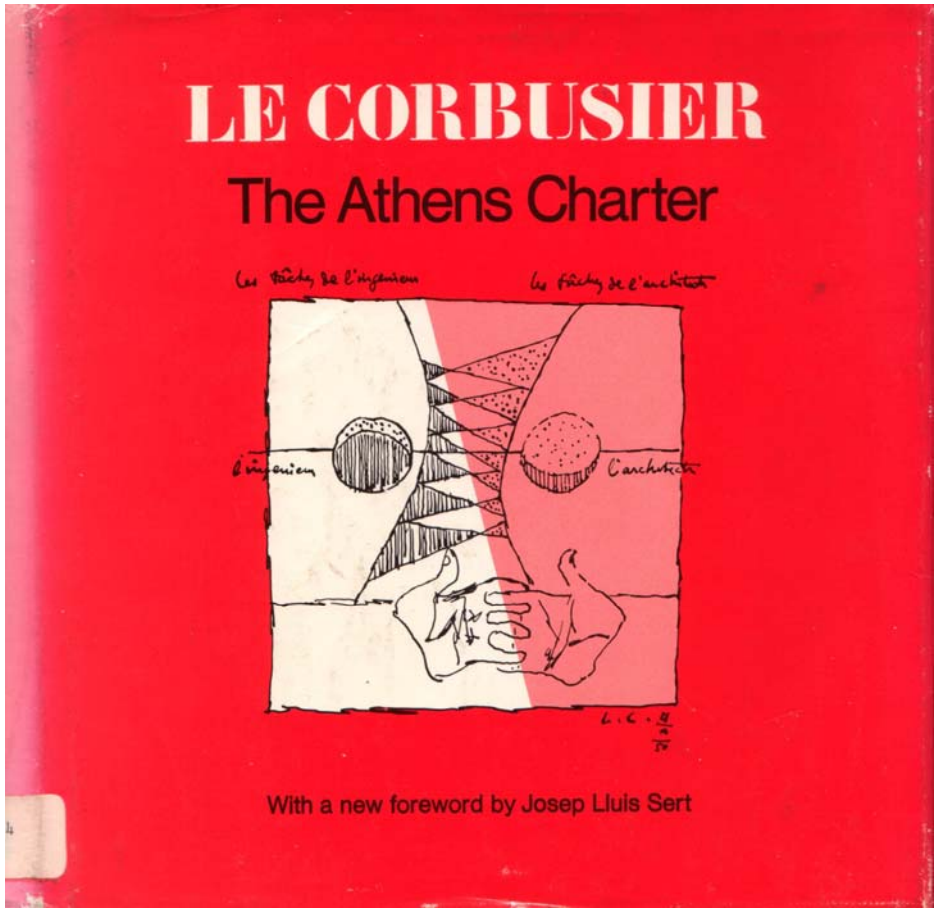


19th & 20th Century

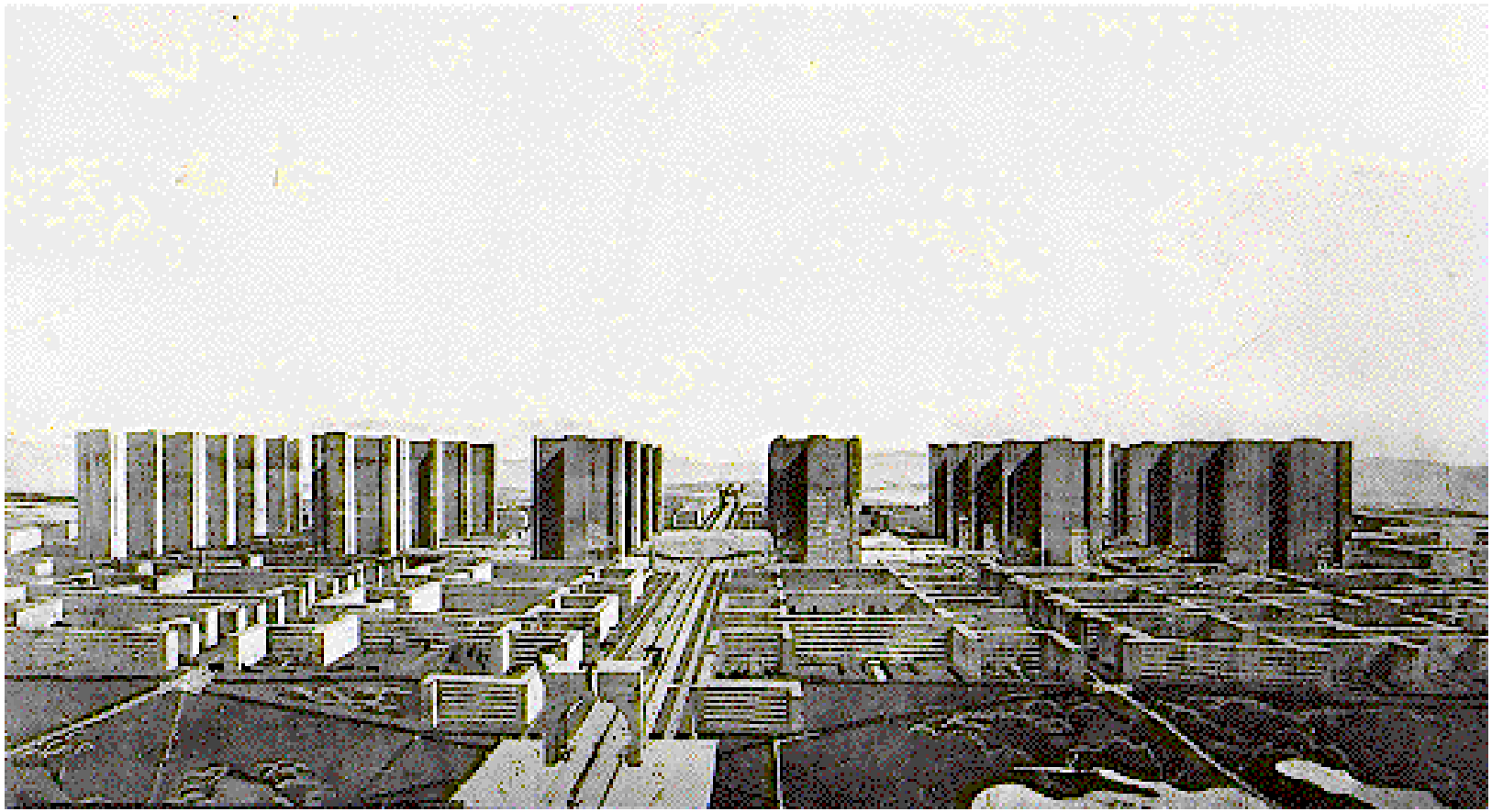
FARR ASSOCIATES
Architecture | Planning | Preservation

CIAM

Congress International Architecture Moderne

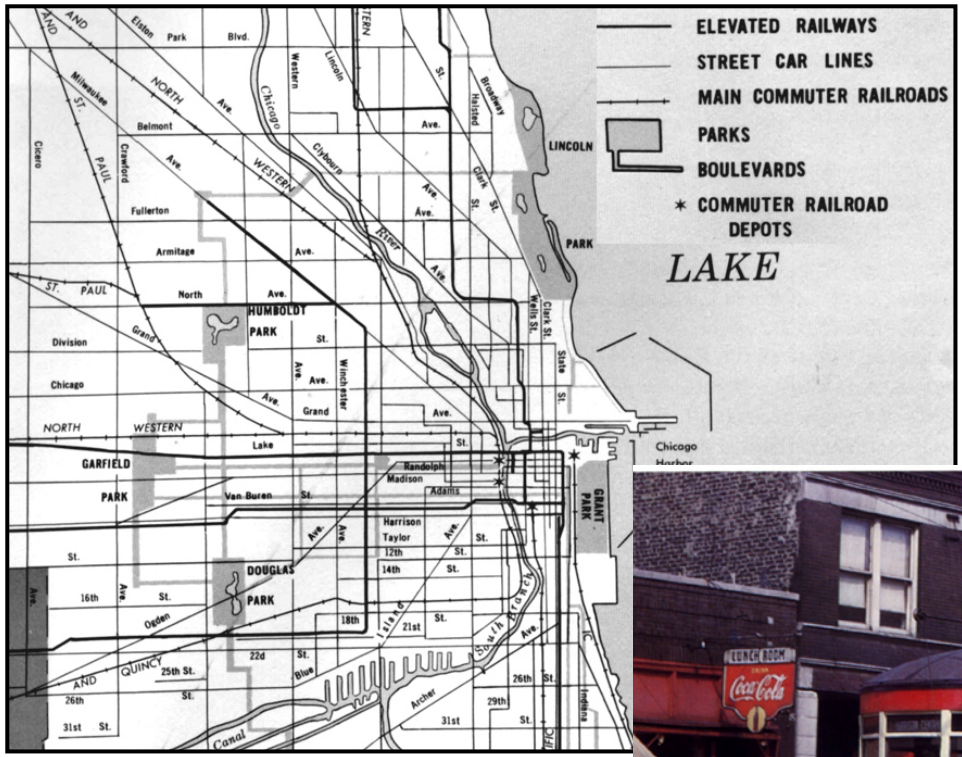


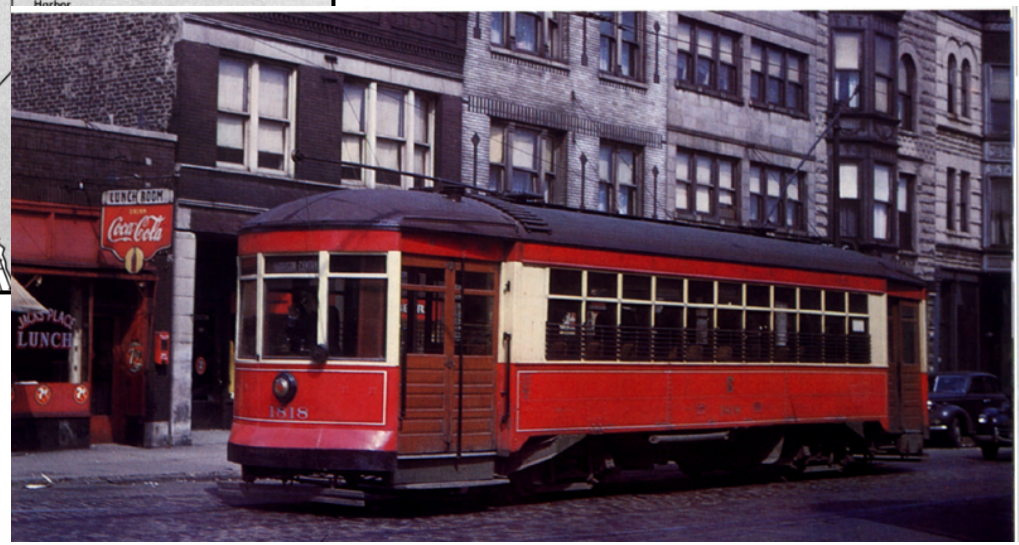
“The Radiant City”



CIAM was a reform movement with a narrow agenda

GM buys Streetcars to grow Bus Market





Late 1940's, early 50's

FARR ASSOCIATES
Architecture | Planning | Preservation

“Radiant” Chicago

1950’s - 1970’s

Conventional Development Patterns

1960's to present

Conventional Suburban Housing

1960’s to present

FARR ASSOCIATES
Architecture | Planning | Preservation

Conventional Development Patterns

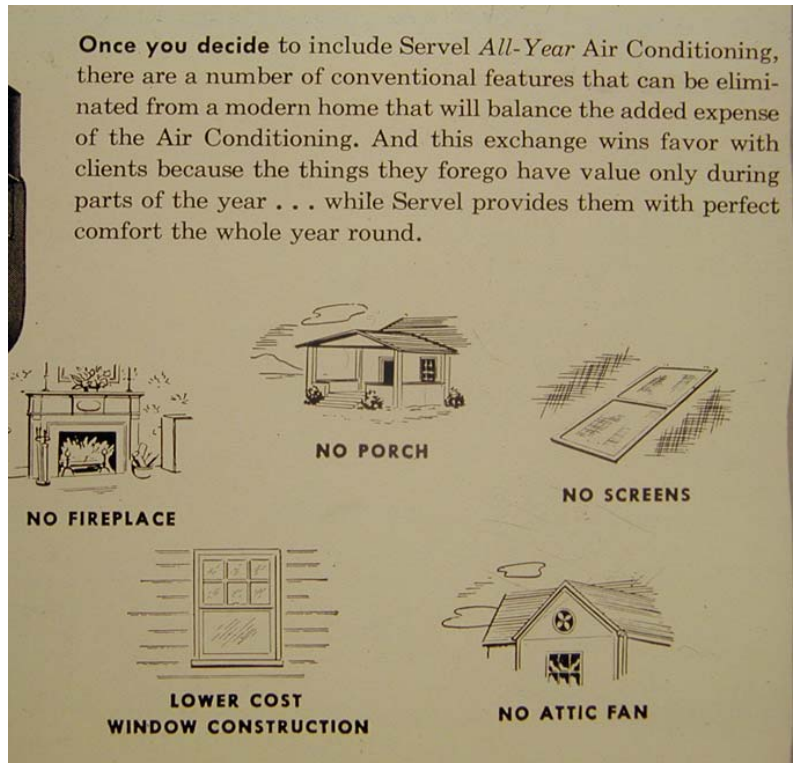
QuickTime™ and a
hoto CD Decompressor
eeded to use this picture

1960's to present

FARR ASSOCIATES
Architecture | Planning | Preservation

The Move Indoors

Progressive Architecture ca. 1960



1960's to present

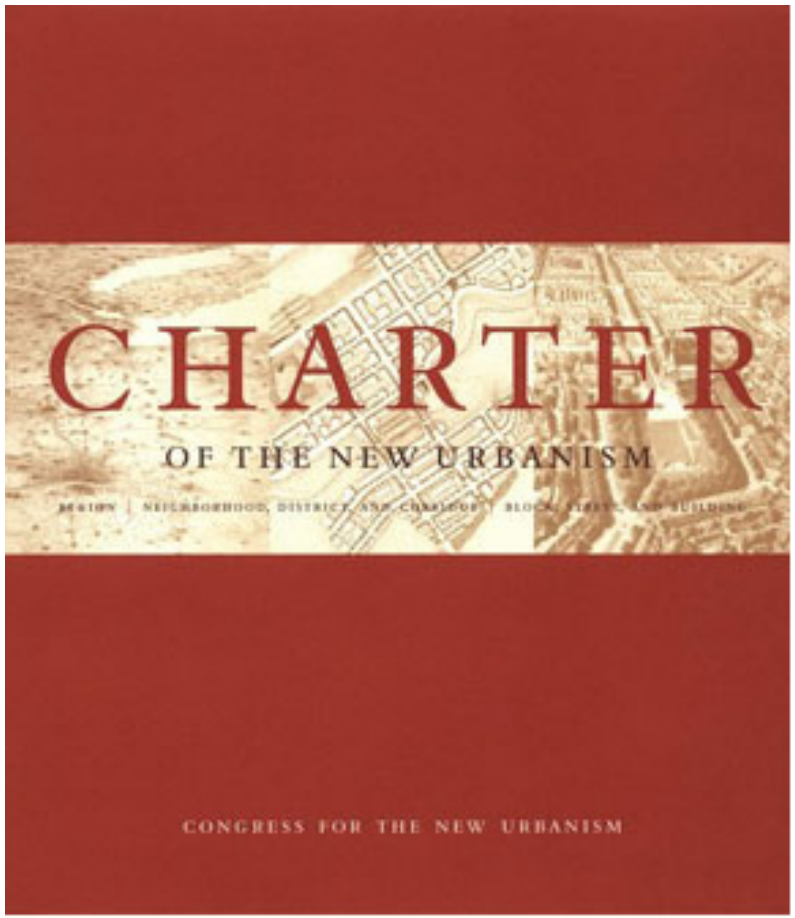
FARR ASSOCIATES

Architecture | Planning | Preservation

Our Current Sustainability Leader

1970-74

Charter of the New Urbanism



1993

FARR ASSOCIATES
Architecture | Planning | Preservation

Embrace of Traditional Urbanism

Traditional Neighborhood development

r

e

Naperville, IL.

1900-1920

Chicago, IL.

FARR ASSOCIATES

Architecture | Planning | Preservation

Embrace of Traditional Architecture

Traditional Neighborhood development

Rural Farmhouse

45’ lot
2 dwellings

Charleston Single House

25-30’ lot
1 dwelling

Georgetown Rowhouses

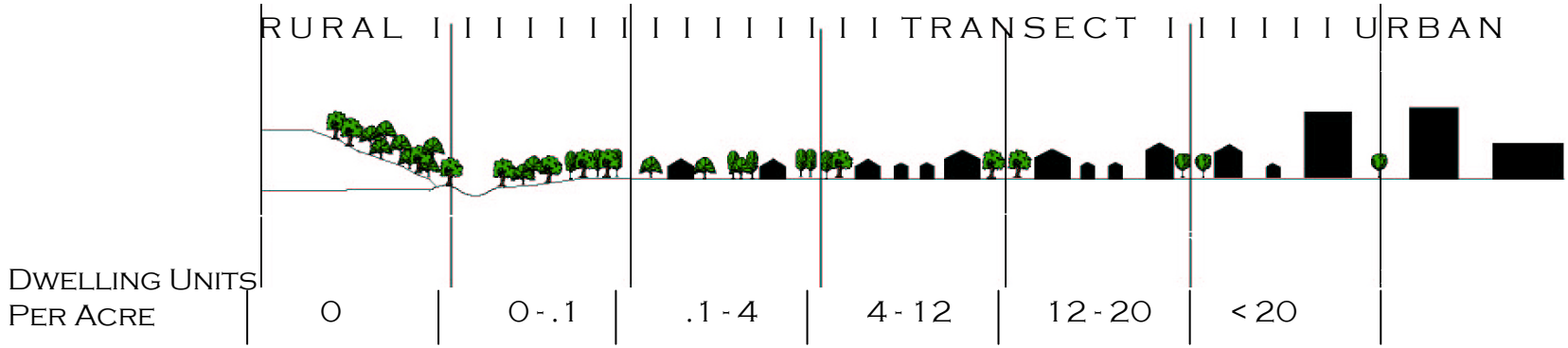
16-24’ lot
1 dwelling

FARR ASSOCIATES
Architecture | Planning | Preservation

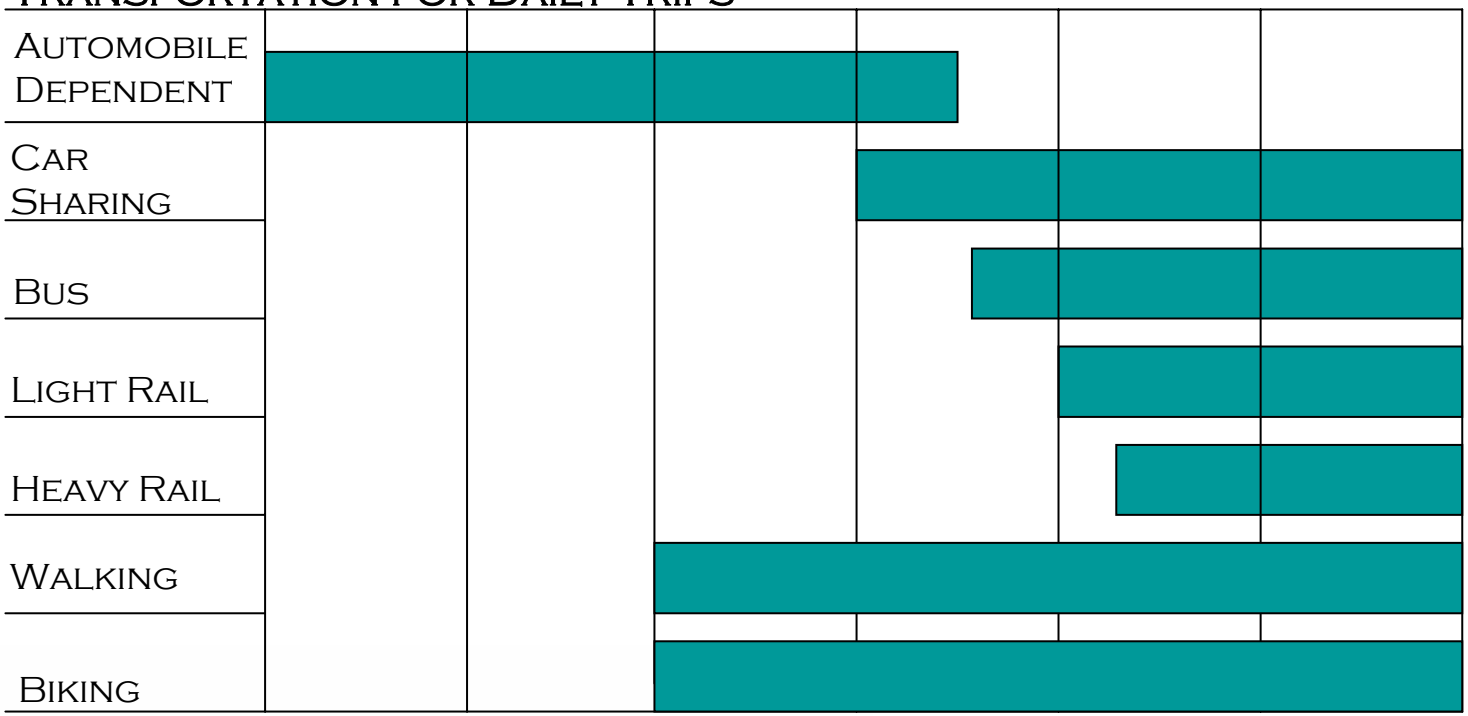
Rediscovery of the Neighborhood

Clarence Perry, 1926

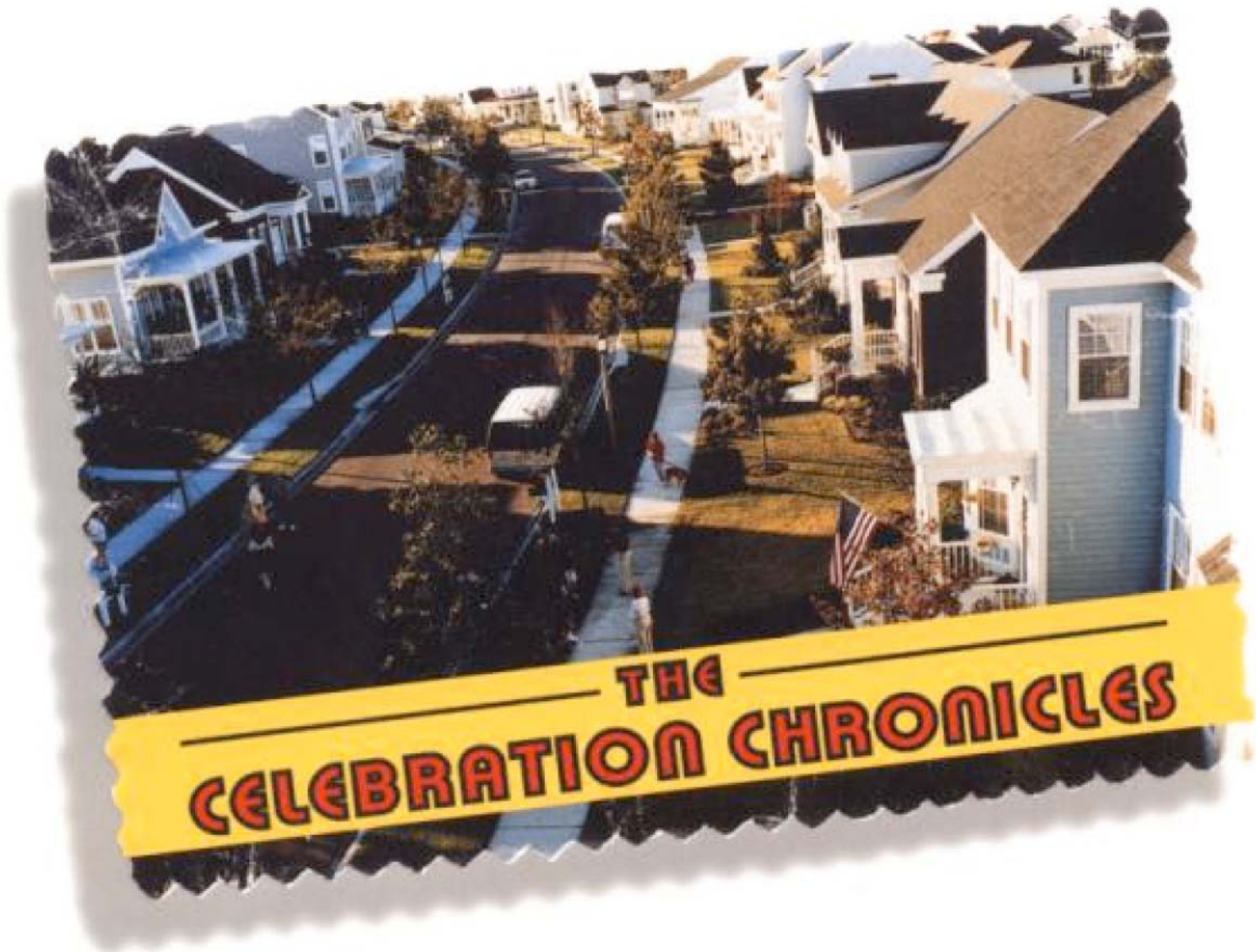
Benefits of Density/Walkability



TRANSPORTATION FOR DAILY TRIPS



FARR ASSOCIATES
Architecture | Planning | Preservation


THE
CELEBRATION CHRONICLES

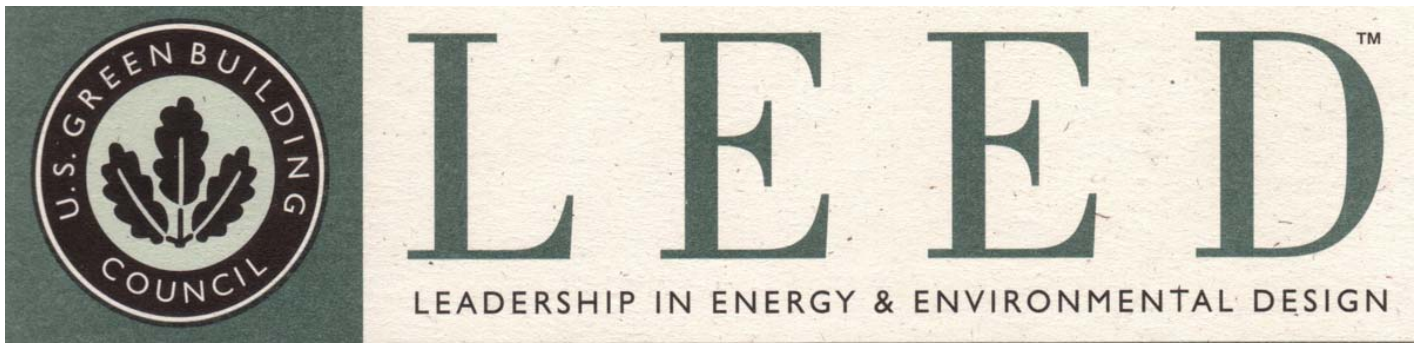
A Green Building Critique of Seaside

Where is the A.C. condenser?

Held together by paint

FARR ASSOCIATES
Architecture | Planning | Preservation

Green Building Requirements



1998, 2000 to present

FARR ASSOCIATES
Architecture | Planning | Preservation

Chicago Center for Green Technology

LEED Platinum (3rd in US)

2000 - 2002

FARR ASSOCIATES

Architecture | Planning | Preservation

Stormwater Detention & Filtration

QuickTime™ and a
Photo - JPEG decompressor
are needed to see this picture.

Detention Area

Bioswale

FARR ASSOCIATES
Architecture | Planning | Preservation

Building-centric, trying to grow

QuickTime™ and a
hoto CD Decompressor
eeded to use this picture

LEED-Retail?
LEED-Volume Build?

FARR ASSOCIATES
Architecture | Planning | Preservation

Location Efficiency

LEED-CI Pilot

"The LEED Rating System does not distinguish between the size (or quantity) of mass transit systems in proximity to a project... Awarding extra credit would create an added advantage for projects located in larger metropolitan areas."

FARR ASSOCIATES
Architecture | Planning | Preservation

Paved, Auto-Dominated Zones

QuickTime™ and a

ıoto CD Decompressor

ɛeded to use this picture

FARR ASSOCIATES

Architecture | Planning | Preservation

Density/VMT Rule of thumb

Each doubling of residential density results in a 25 - 30% reduction in vmts per family

John Holtzclaw, Sierra Club

FARR ASSOCIATES
Architecture | Planning | Preservation

How are we doing right now?

(5 minutes)

FARR ASSOCIATES
Architecture | Planning | Preservation

U.S. Vehicle Miles Traveled

Registered Cars : 130,000,000 (1 car per 2 people)
Licensed Drivers: 190,000,000 (68 cars per 100 drivers)
2000 U.S. VMT: 2,700,000,000,000 Miles
VMT increase from 1980 to 1997: 68%
One Light Year: 5,800,000,000,000 Miles

Source: FHWA, Highway Statistics 2000

FARR ASSOCIATES
Architecture | Planning | Preservation

Retail Choices/Economic Development

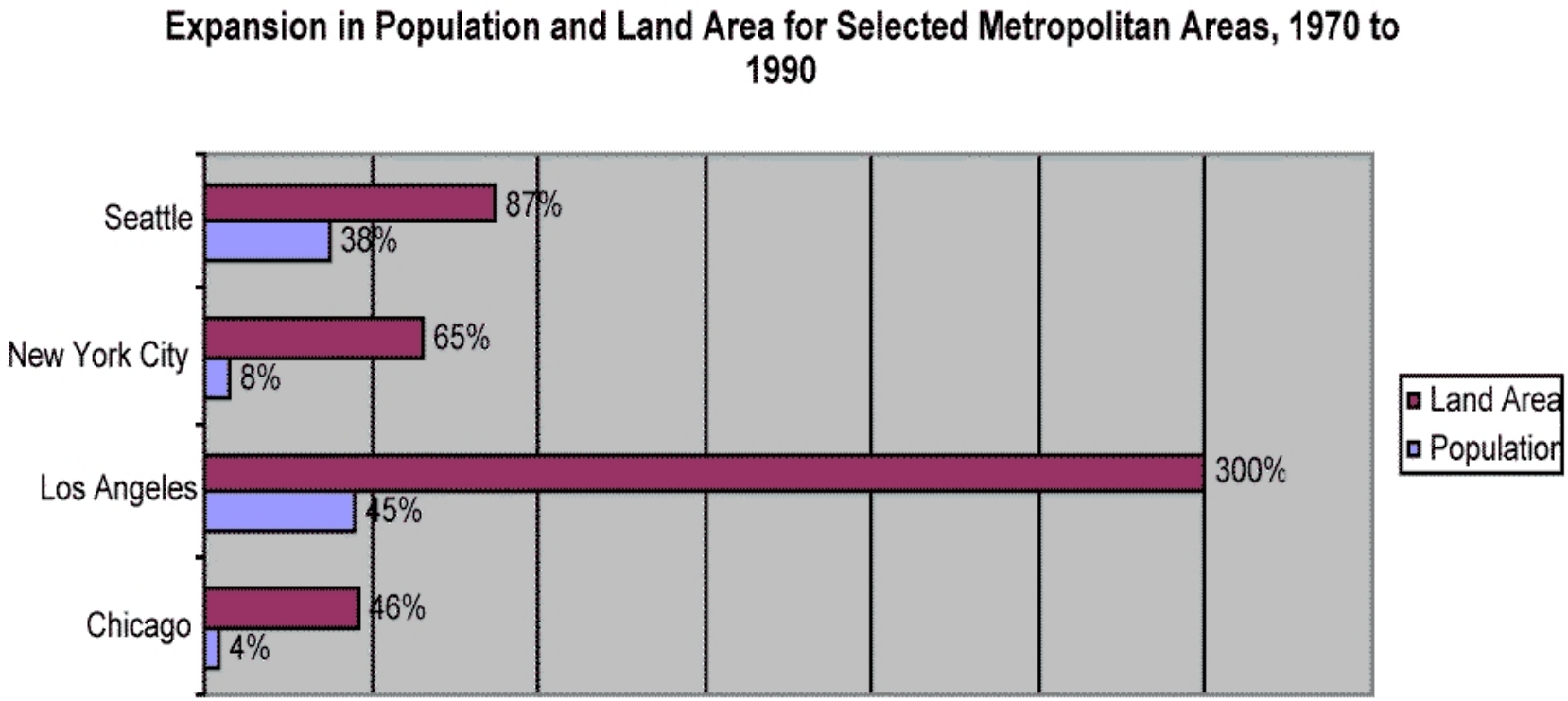
Chain Store
$43 of $100 stays local

Locally Owned Store
$73 of $100 stays local

Source: Civic Economics

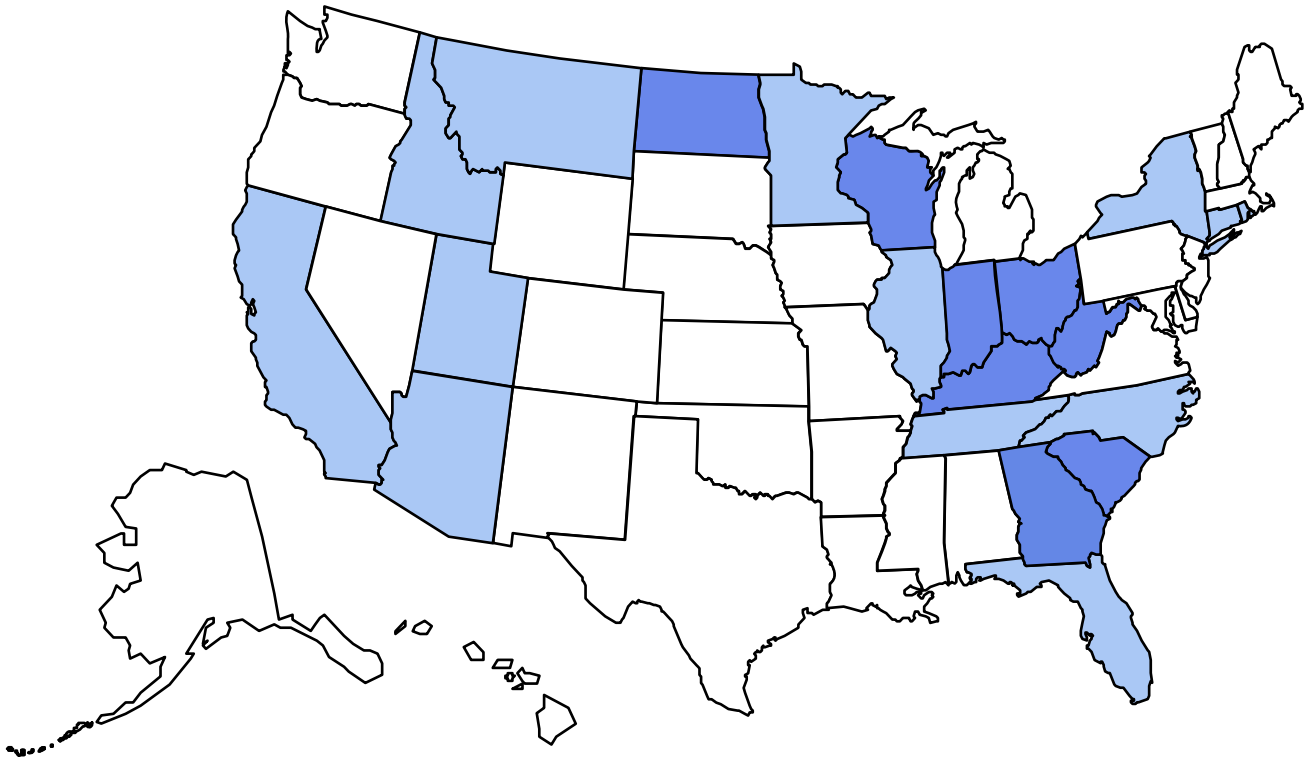
FARR ASSOCIATES
Architecture | Planning | Preservation

Land Consumption



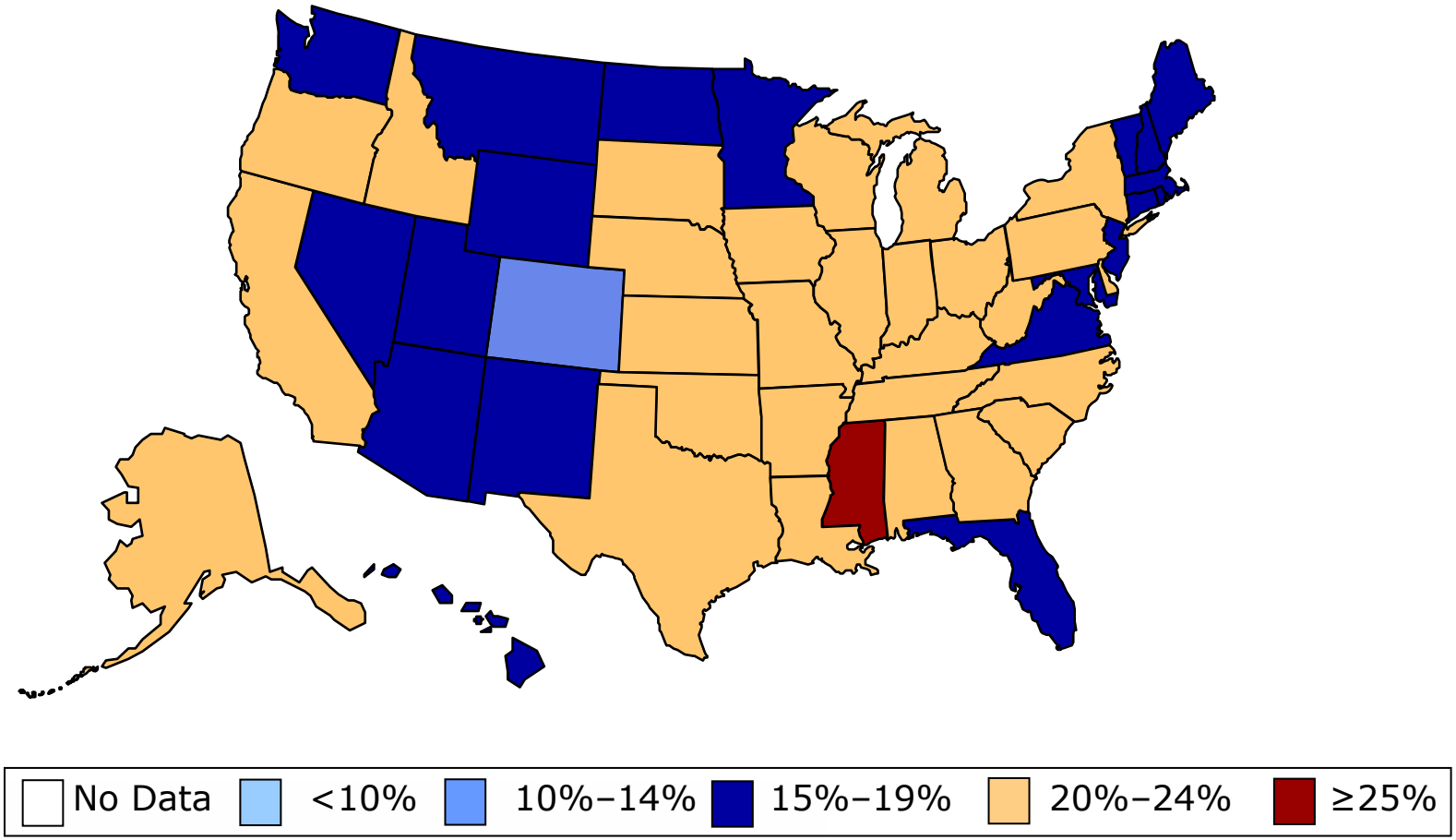
Obesity Trends* Among U.S. Adults
BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)



Obesity Trends* Among U.S. Adults
BRFSS, 2001

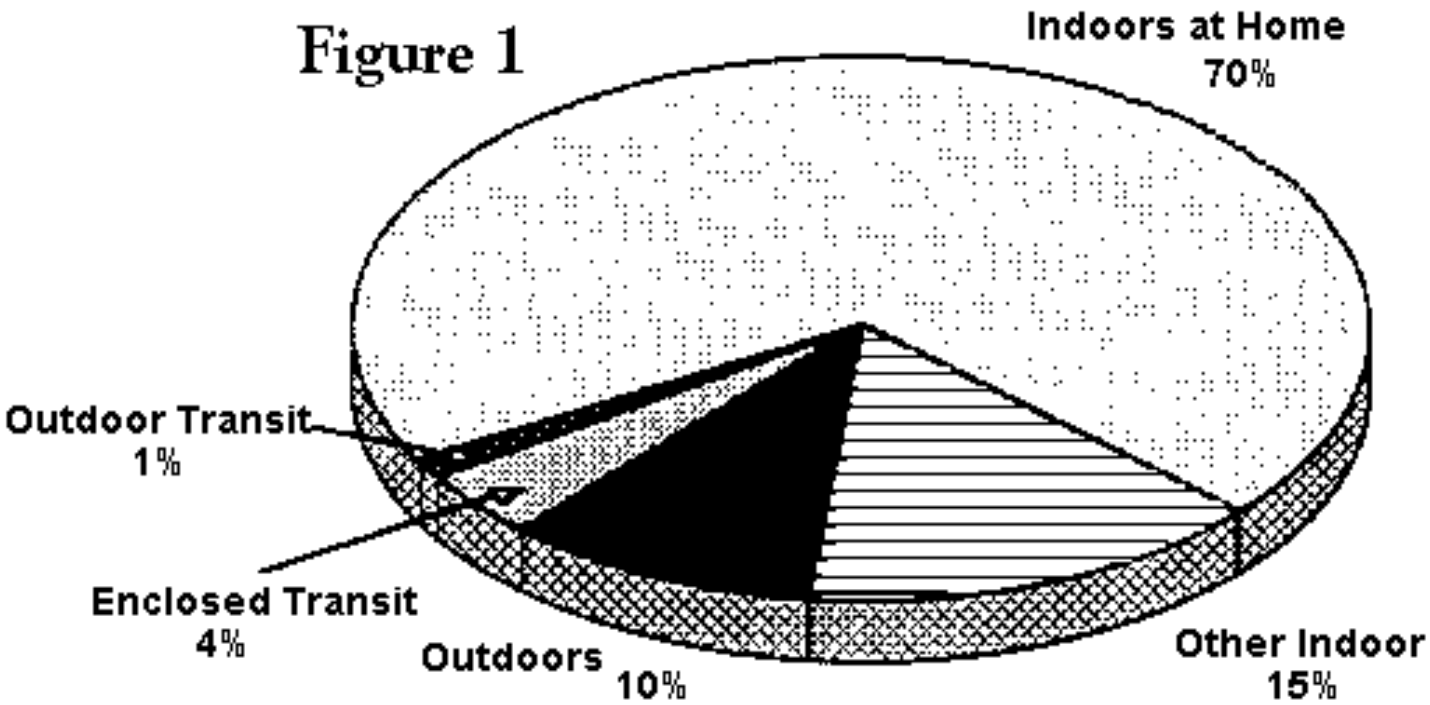
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)



Non-Point Source Runoff

Time Spent Indoors

English speaking Californians 11 and younger



Indoor Air is 2 to 10 times more polluted than outdoor air

Air Quality

Outdoors

Country

Base Case

City

10-50% Dirtier

11%

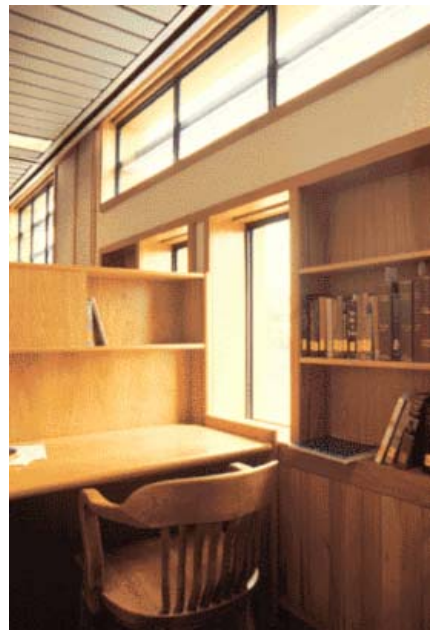
Indoors

Car in Traffic

200-1200% Dirtier

4%

In Building



200-1000% Dirtier

85%

FARR ASSOCIATES
Architecture | Planning | Preservation

U.S. CO_2 Emissions
Buildings vs. Transportation

Transportation	484.9 m.tons	32.6%
Residential	284.5 m.tons	19.0%
Commercial	238.4 m.tons	15-16%
Buildings Subtotal		34-5%

Oak Ridge Labs

Transportation is the fastest growing sector

Is there any hope?

(5 minutes)

In the news

the ONION®

VOLUME 36 ISSUE 43 AMERICA'S FINEST NEWS SOURCE 30 NOVEMBER–6 DECEMBER 2000

Report: 98 Percent Of U.S. Commuters Favor Public Transportation For Others

WASHINGTON, DC—A study released Monday by the American Public Transportation Association reveals that 98 percent of Americans support the use of mass transit by others.

"With traffic congestion, pollution, and oil shortages all getting worse, now is the time to shift to affordable, efficient public transportation," APTA director Howard Collier said. "Fortunately, as this report shows, Americans have finally recognized the need for everyone else to do exactly that."

Of the study's 5,200 participants, 44 percent cited faster commutes as the primary reason to expand public transportation, followed closely by shorter lines at the gas automobile.

"When public transportation is not practical, commuters should at least be carpooling," Collier said. "Most people, unlike me, probably work near someone they know and don't need to be driving alone."

Collier said he hopes the study serves as a wake-up call to Americans. In conjunction with its release, the APTA is kicking off a campaign to promote mass transit with the slogan, "Take The Bus... I'll Be Glad You Did."

The campaign is intended to de-emphasize the inconvenience and social stigma associated with using public transportation, focusing instead on the positives.

Above: Traffic moves slowly near Seattle, WA, where a majority of drivers say they support other people using mass transit.

Land Use/Transportation Linkage

(by Family)

	Average Lot Size	Units Per Sq. Mile	Avg. # of Autos	Avg. Annual Vehicle Miles
City	.02 acres	32,000	<1	8,000
Inner-Ring Suburb	0.125 acres	5,120	1-2	15,000
Outer-Ring Suburb	1 acre	640	2-3	27,500
Exurb	5 acres	128	3+	30,000

The Wealth of Cities, John Norquist

Ideal Neighborhood Plan

Transit

Storm water

Sewage

Heat island

Power

Food

“Green” Infrastructure

FARR ASSOCIATES

Architecture | Planning | Preservation

Life Cycle of Housing

Traditional Neighborhood Development

Longmont, CO

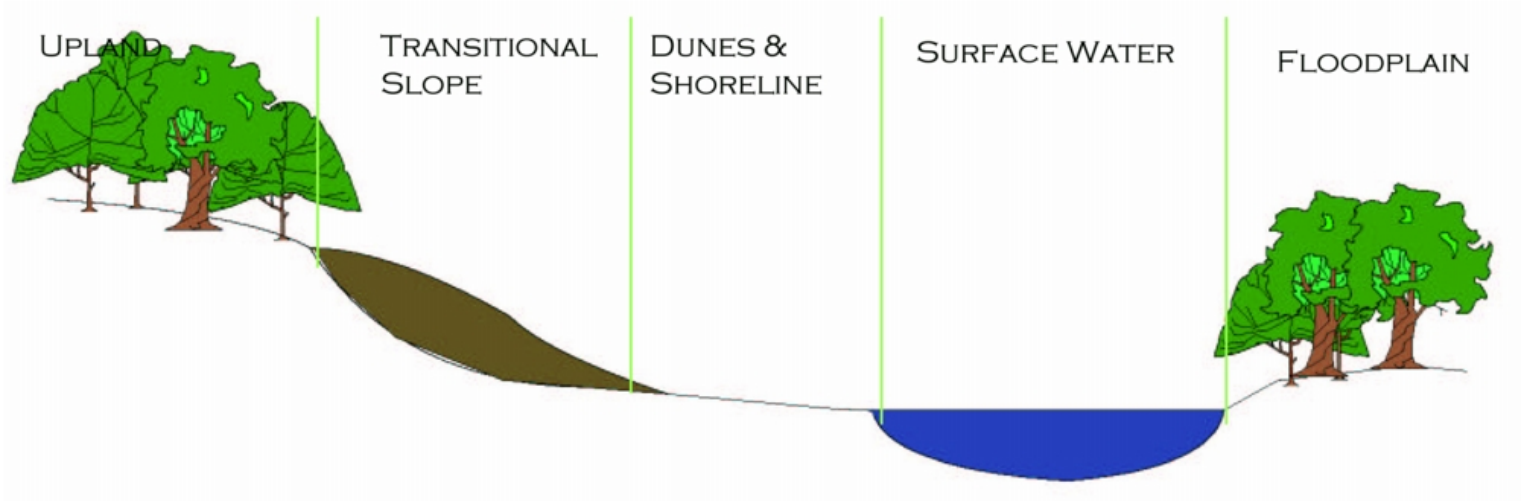
FARR ASSOCIATES

Architecture | Planning | Preservation

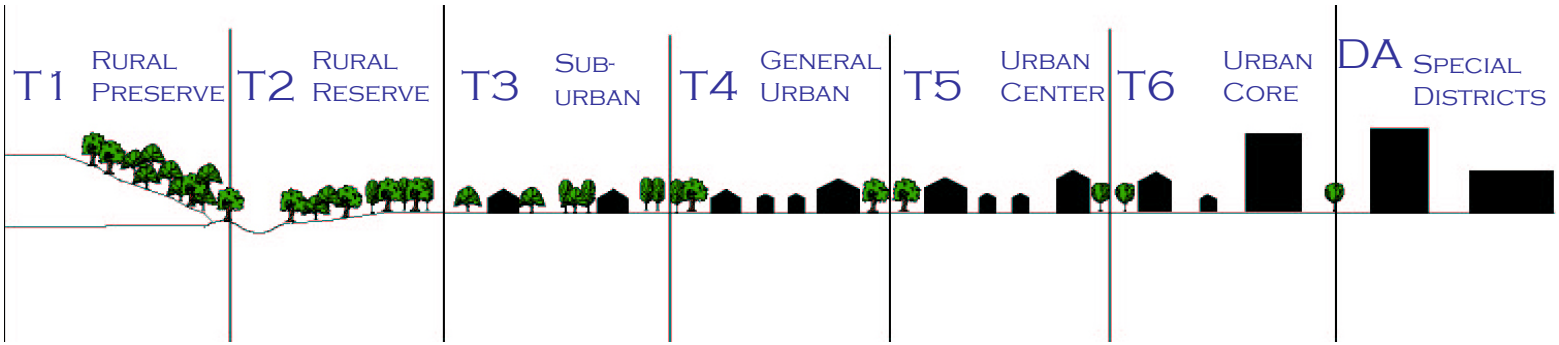
Taking a Transect

Transects

Natural Transect



Human Transect (Biomimicry for Planners)

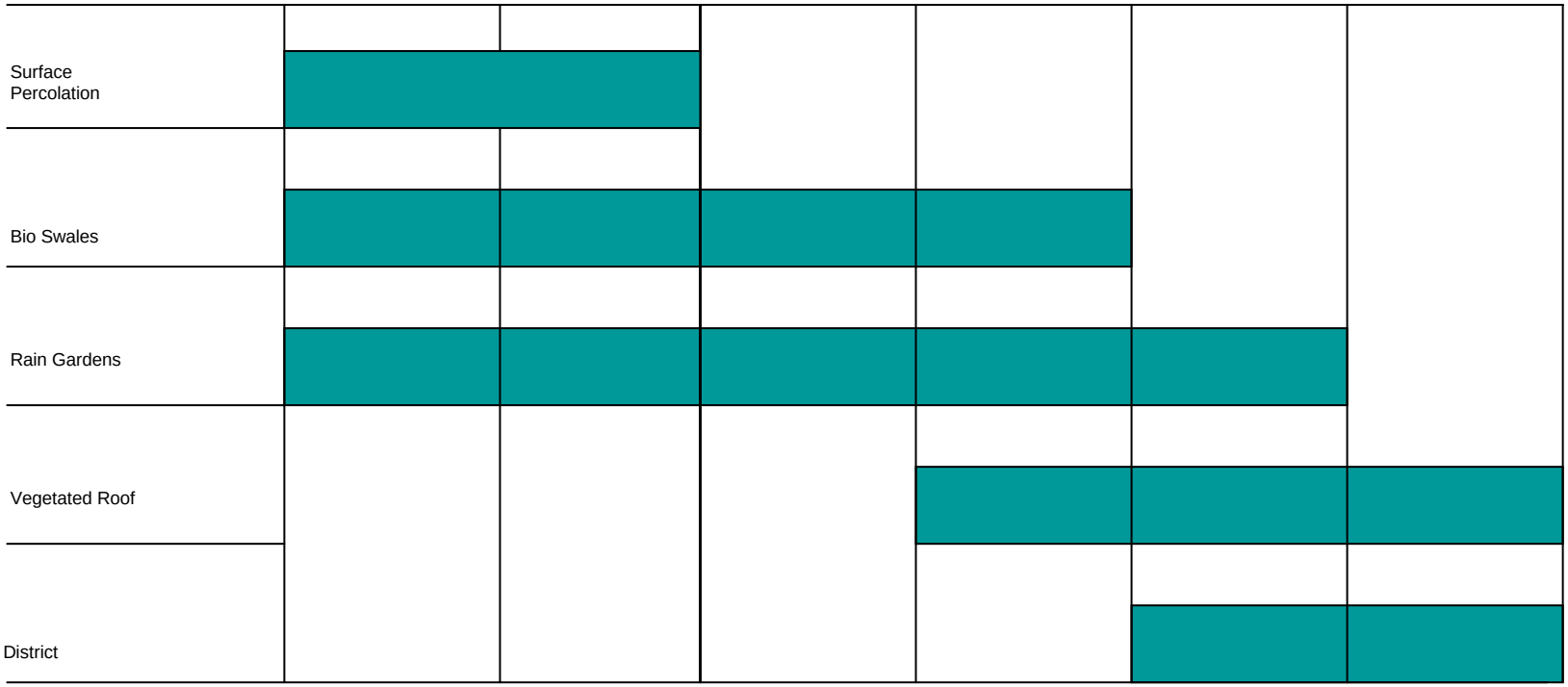


Per capita impacts increase as density decreases

Transect

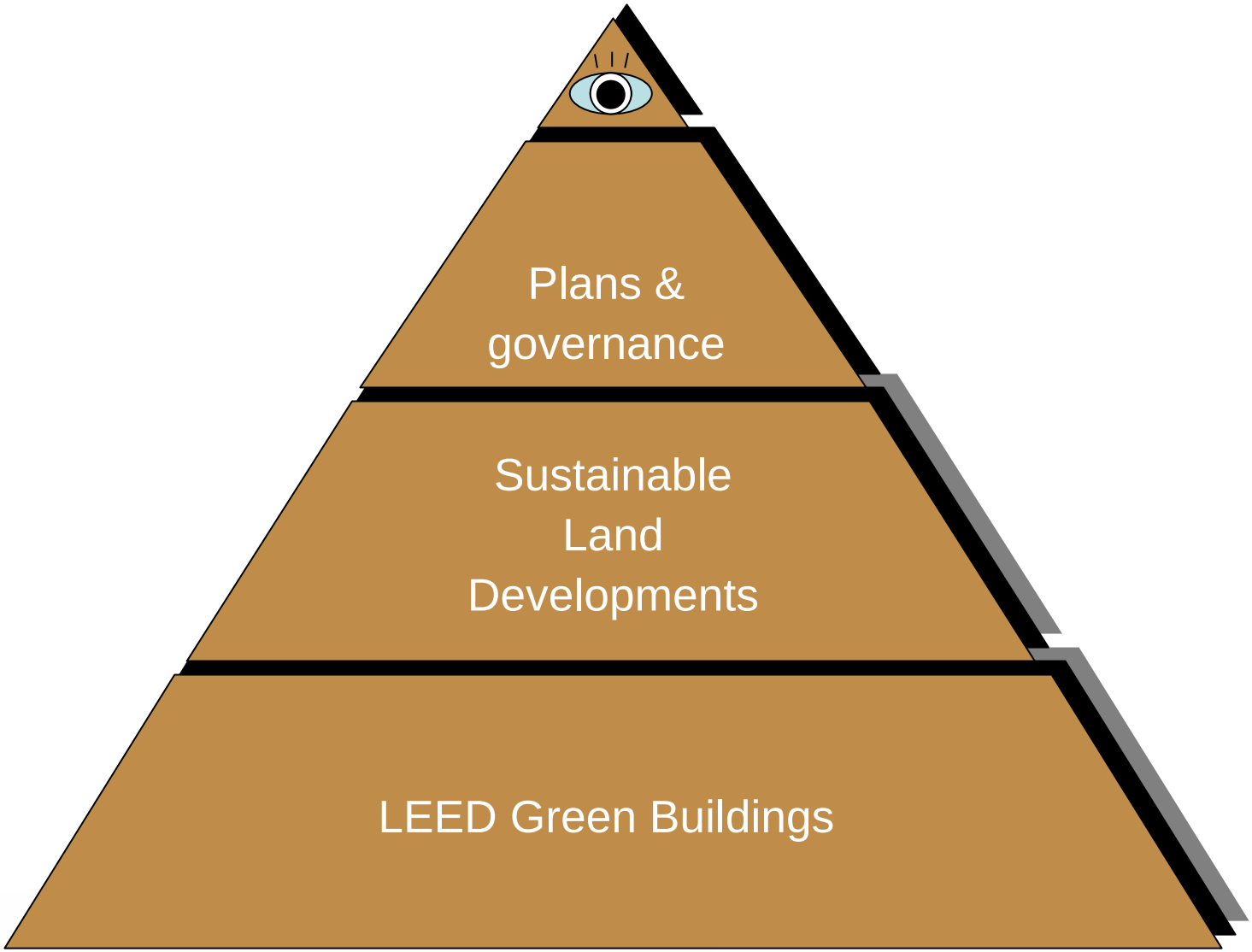
	T1 Rural Preserve	T2 Rural Reserve	T3	T4 General Urban	T5 Urban Center	T6 Urban Core	DA
Dwelling Units Per Acre	0	0 - .1	.1 - 4	4 - 12	12 - 20	< 20	

Storm Water Filtration of Impervious Surfaces (BMP's)



FARR ASSOCIATES
Architecture | Planning | Preservation

The Sustainability Pyramid

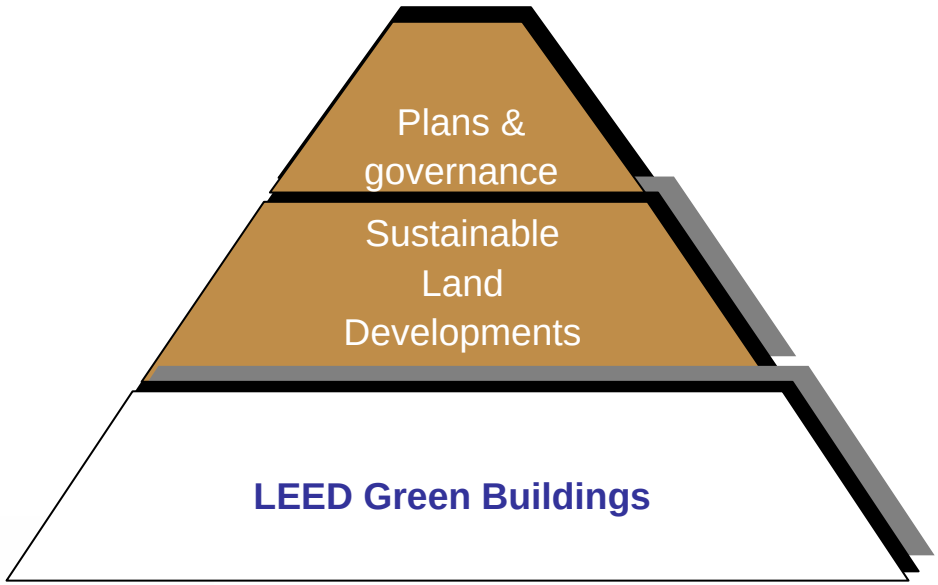


FARR ASSOCIATES
Architecture | Planning | Preservation

The Sustainability Pyramid

LEED Green Buildings

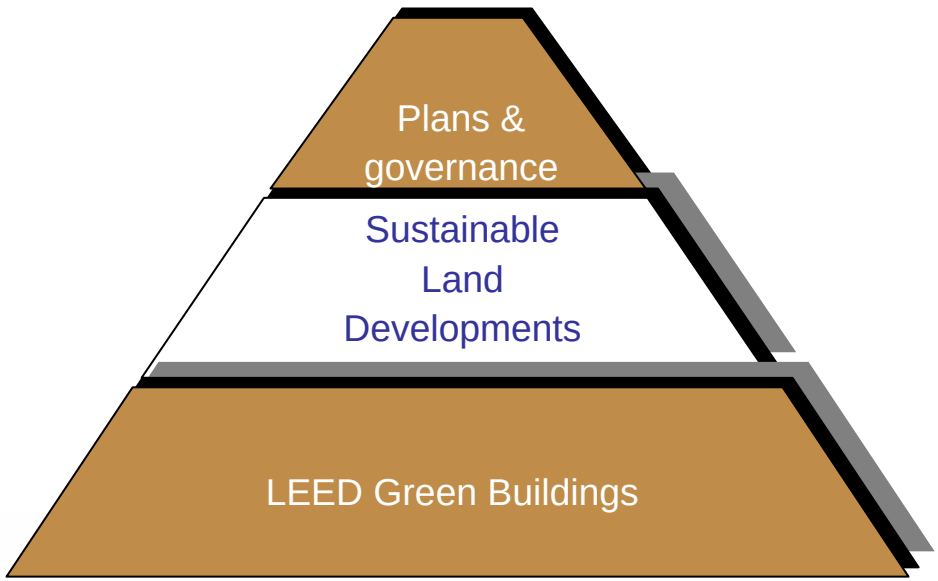
New Construction (NC)
Existing Buildings (EB)
Commercial Interiors (CI)
Core and Shell (CS)
Homes (H)



The Sustainability Pyramid

“SMART” NEIGHBORHOOD DEVELOPMENT

LEED-Neighborhood development
Existing neighborhood (EN)
District (d)
Landscape (l)
Infrastructure systems (IS)



FARR ASSOCIATES
Architecture | Planning | Preservation

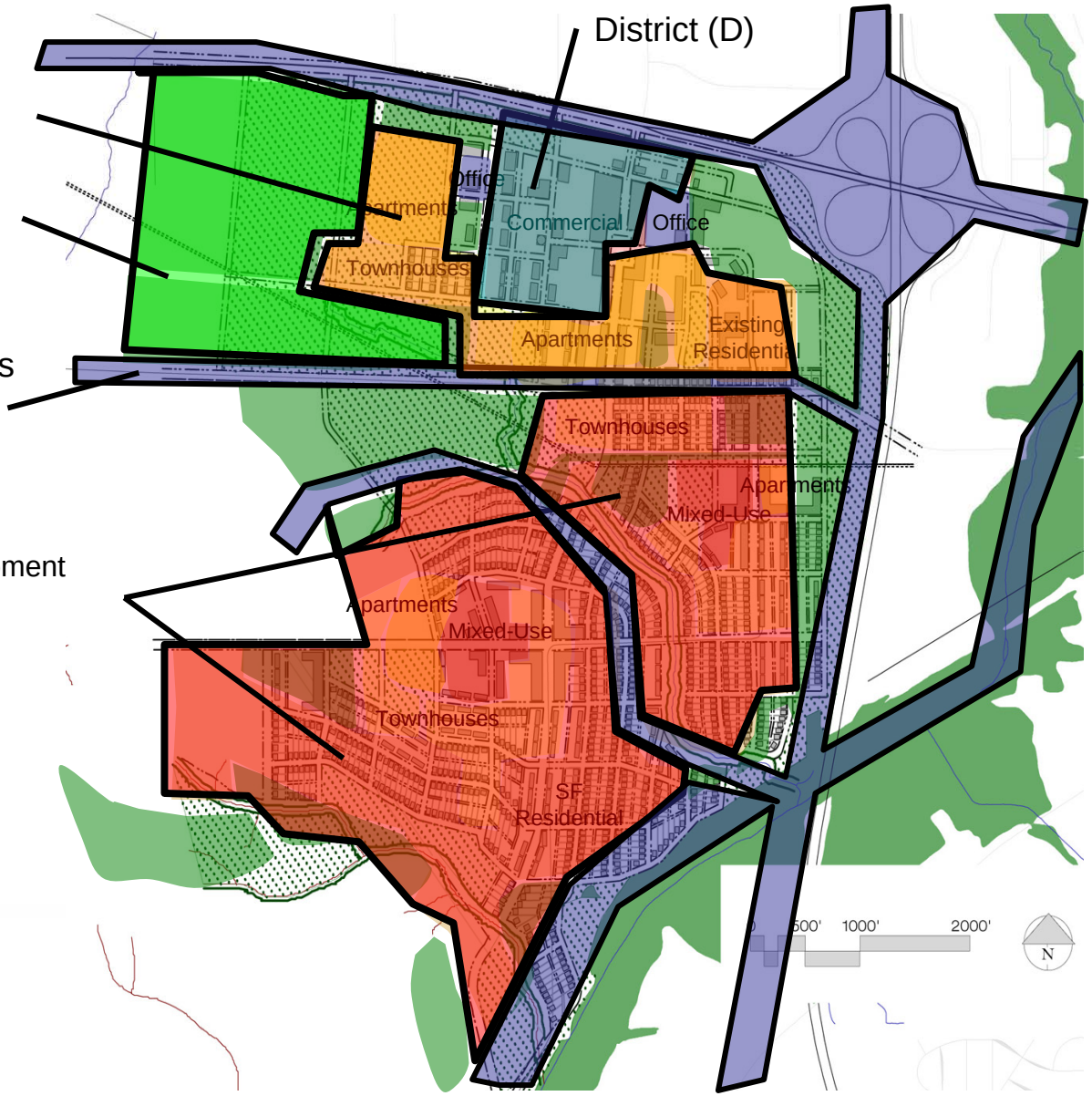
Proposed Certification Products for Sustainable Land Developments

Existing (EN) Neighborhood

Landscape (L)

Infrastructure Systems (IS)

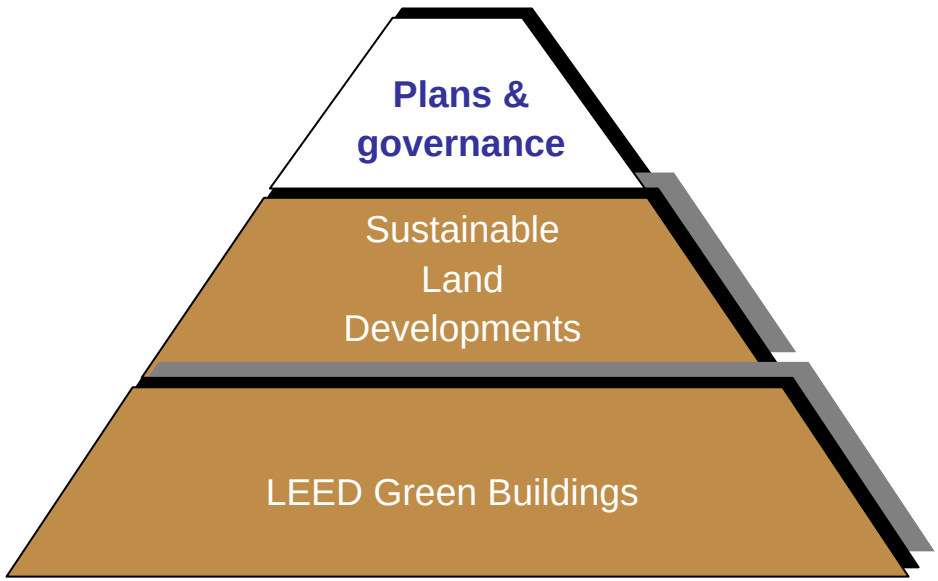
Neighborhood Development (ND)



The Sustainability Pyramid

Plans and Governance

Regional plan (RP)
Municipality (M)
State (S)



LEED® for
Neighborhood Developments

FARR ASSOCIATES
Architecture | Planning | Preservation

What is LEED-ND?

Joint venture of USGBC, CNU, NRDC (SG)

national certification for “smart” development

Primary market: development teams

Secondary market : planners & local government

How does LEED-ND apply?

developments of multiple buildings and developer-supplied infrastructure

May be mixed-use, or entirely residential or commercial if adding diversity to surrounding area

Will inform land-use component of LEED

How is LEED-ND organized?

Four Categories

- Location Efficiency
- Environmental preservation
- Compact, Complete and Connected Neighborhoods
- Resource efficiency

Location Efficiency

Infill and redevelopment sites

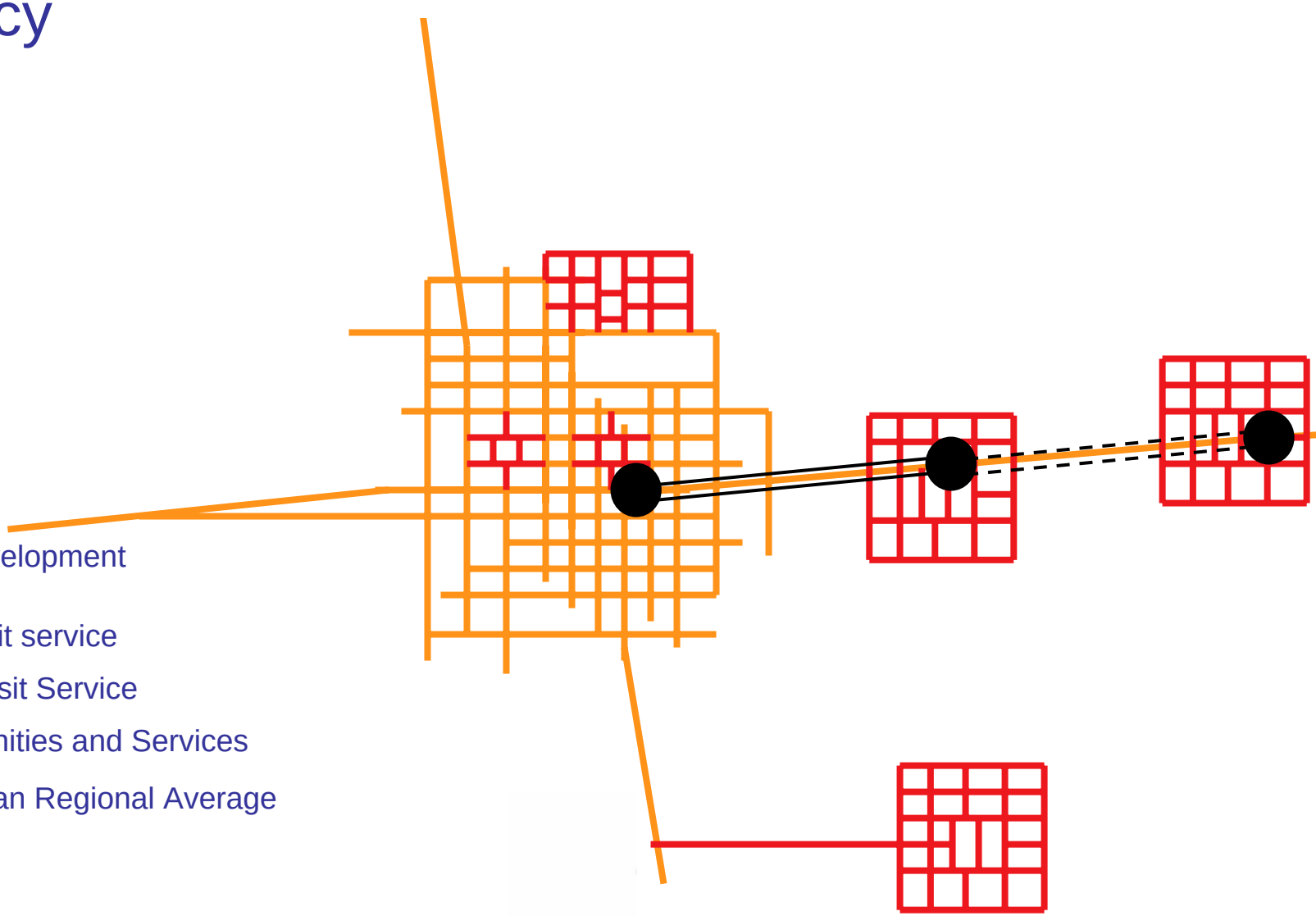
Transit served locations

Transit amenities

Jobs-Housing Balance

Access to Open Space

Prerequisite 1.01:
Transportation Efficiency



Infill or Redevelopment

Existing transit service

Planned Transit Service

Existing Amenities and Services

Drive Less than Regional Average

Environmental Preservation

Erosion & sedimentation control

Wetland and water body protection

Minimize site disturbance

Parkland/farmland preservation

Stormwater volume management/treatment

Compact, complete, and connected neighborhoods

Density

Mix/Proximity of uses

Pedestrian friendliness, street connectivity

Historic preservation, character

Access to green space

Diverse and Affordable housing

Resource Efficiency

Green building design

Heat island reduction (roof & non-roof)

Construction waste management

Locally provided materials

On-site power generation

Compost/recycling facilities

How can roads be like carpet?

FARR ASSOCIATES
Architecture | Planning | Preservation

2004 Case Studies

Conceptual Ratings

FARR ASSOCIATES
Architecture | Planning | Preservation

Test Case:
Conservation Development

Aurora, IL

Guiding Principles:

- Protect against flooding
- Enhance water quality
- Provide adequate buffers/greenways along stream channels

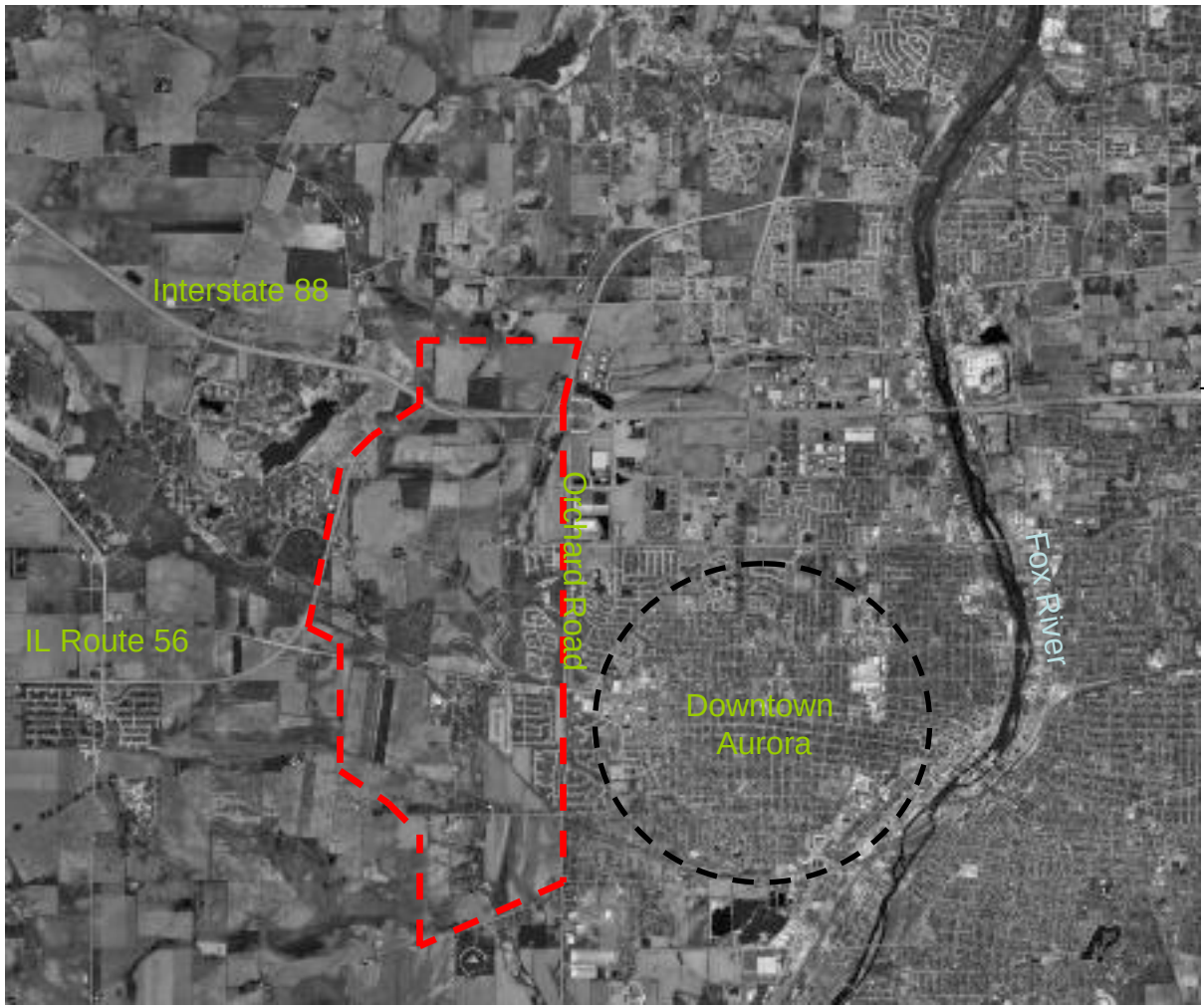
"Intention is to look at the land carefully and understand its characteristics before imposing a built environment"

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

FARR ASSOCIATES
Architecture | Planning | Preservation

Countryside

Location and Linkages



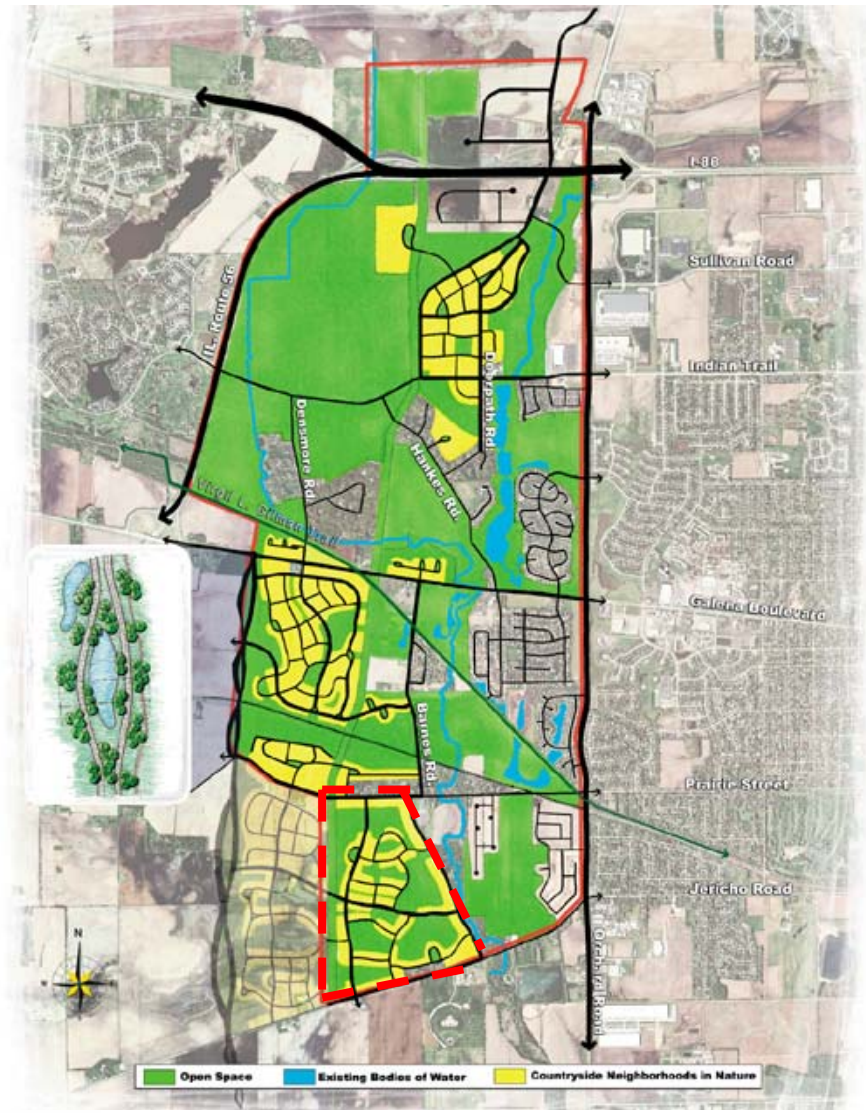
FARR ASSOCIATES

Architecture | Planning | Preservation

Conservation Development

Neighborhood Pattern and Design

- Designed in 2002
- 80 acres
- 50% open space
- 80+ dwelling units
- Housing clusters
- Lots average 1/2 acre
- Proposed future phases will have commercial



FARR ASSOCIATES
Architecture | Planning | Preservation

Conservation Development

Site plan detail

Illustrative housing cluster

Parking lot with trees

Vegetated swale

FARR ASSOCIATES

Architecture | Planning | Preservation

Prerequisite Scorecard

Does the development meet prerequisites?

LE: P1.01 - Transportation Efficiency	N
LE: P1.02 - Municipal Service Efficiency	
EP: P1.01 - Imperiled Species & Ecological Communities	
EP: P1.02 - Parkland Preservation	
EP: P1.03 - Wetland & Water Body Protection	
EP: P1.04 - Erosion & Sedimentation Control	
EP: P1.05 - Farmland Preservation	N
CCCN: P1.01 - Open Community	
CCCN: P1.02 - Compact Development	N

Credit Scorecard

Category	Points Possible	Estimated Score
Location Efficiency	27	5
Environmental Preservation	16	14
Compact, Complete & Connected Neighborhoods	42	8
Resource Efficiency	25	5
		37

40%: LEED Certified 50%: Silver 60%: Gold 80% Platinum

Atlantic Station

FARR ASSOCIATES
Architecture | Planning | Preservation

Atlantic Station

Atlanta, GA

- Reclamation of former Atlantic Steel Mill
- Largest urban brownfield redevelopment in US
- Three area mixed-use development

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

FARR ASSOCIATES
Architecture | Planning | Preservation

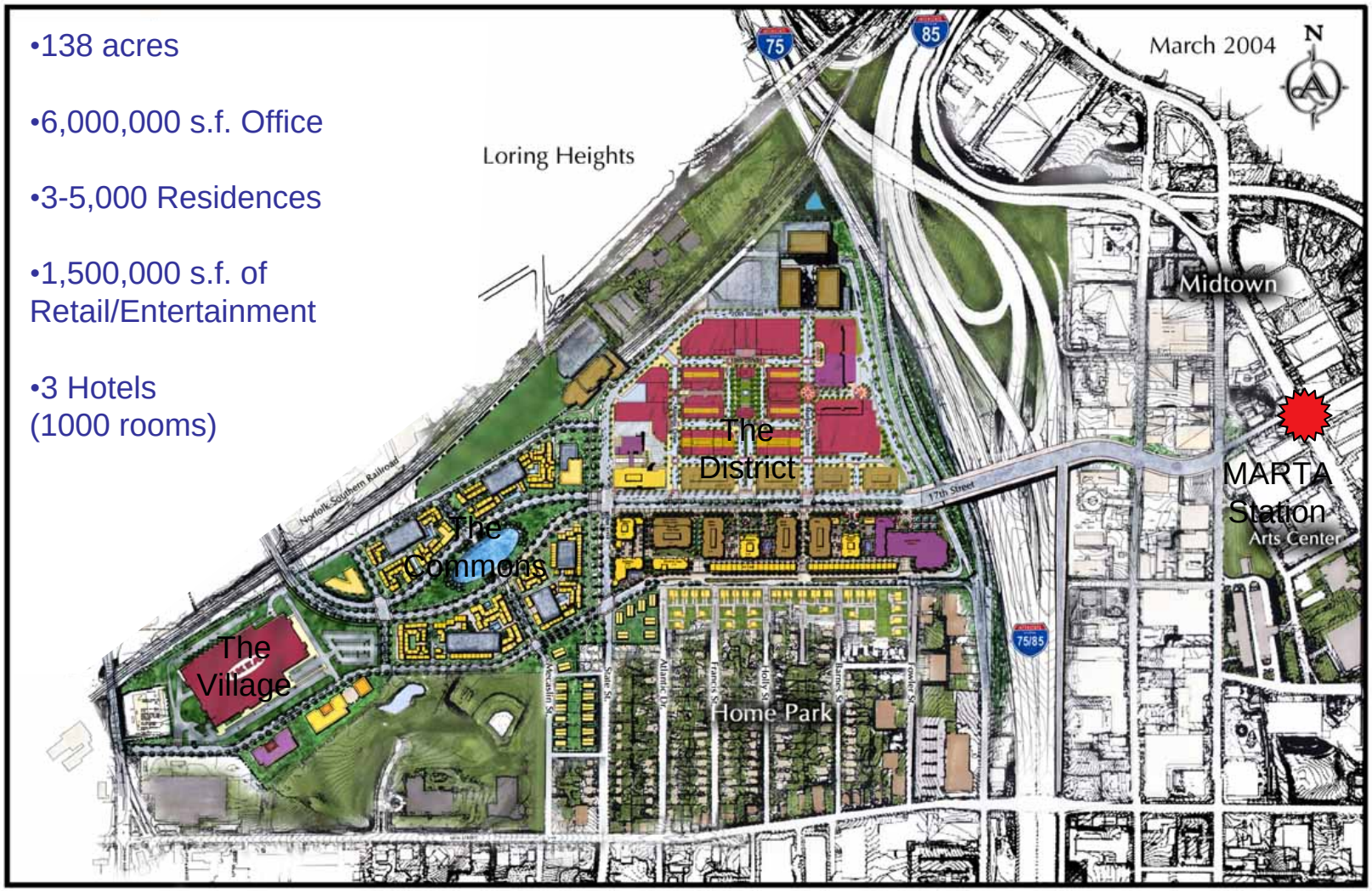
Atlantic Station

Location and Linkages

Atlantic Station

Neighborhood Pattern and Design

- 138 acres
- 6,000,000 s.f. Office
- 3-5,000 Residences
- 1,500,000 s.f. of Retail/Entertainment
- 3 Hotels (1000 rooms)



Altantic Station

Prerequisite Scorecard

Does the development meet prerequisites?

LE: P1.01 - Transportation Efficiency
LE: P1.02 - Municipal Service Efficiency

EP: P1.01 - Imperiled Species & Ecological Communities

EP: P1.02 - Parkland Preservation
EP: P1.03 - Wetland & Water Body Protection

EP: P1.04 - Erosion & Sedimentation Control
EP: P1.05 - Farmland Preservation

CCCN: P1.01 - Open Community
CCCN: P1.02 - Compact Development

Credit Scorecard

Category	Points Possible	Estimated Score
Location Efficiency	27	21
Environmental Preservation	16	4
Compact, Complete & Connected Neighborhoods	42	26
Resource Efficiency	25	10
		61

Likely Rating: 60%: Gold

Kentlands

FARR ASSOCIATES
Architecture | Planning | Preservation

Kentlands

Gaithersburg, MD

Six mixed use neighborhoods, each combining residential, office, civic, cultural and retail usage.

Offers a range of housing types and sizes to encourage diversity in age and income level.

Includes a variety of civic facilities and public open spaces.

Kentlands

Location and Linkages

FARR ASSOCIATES
Architecture | Planning | Preservation

Kentlands

Neighborhood Pattern and Design

- Designed in 1988
- 356 acres
- 1600 dwelling units
- 1 million sf office space
- 1.2 million sf commercial space

300 feet

FARR ASSOCIATES
Architecture | Planning | Preservation

Kentlands

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Architecture | Planning | Preservation

Scorecard

Does the development meet prerequisites?

LE: P1.01 - Transportation Efficiency	N
LE: P1.02 - Municipal Service Efficiency	
EP: P1.01 - Imperiled Species & Ecological Communities	
EP: P1.02 - Parkland Preservation	
EP: P1.03 - Wetland & Water Body Protection	
EP: P1.04 - Erosion & Sedimentation Control	
EP: P1.05 - Farmland Preservation	
CCCN: P1.01 - Open Community	
CCCN: P1.02 - Compact Development	

Credit Scorecard

Category	Points Possible	Estimated Score
Location Efficiency	27	12
Environmental Preservation	16	8
Compact, Complete & Connected Neighborhoods	42	35
Resource Efficiency	25	5
		63

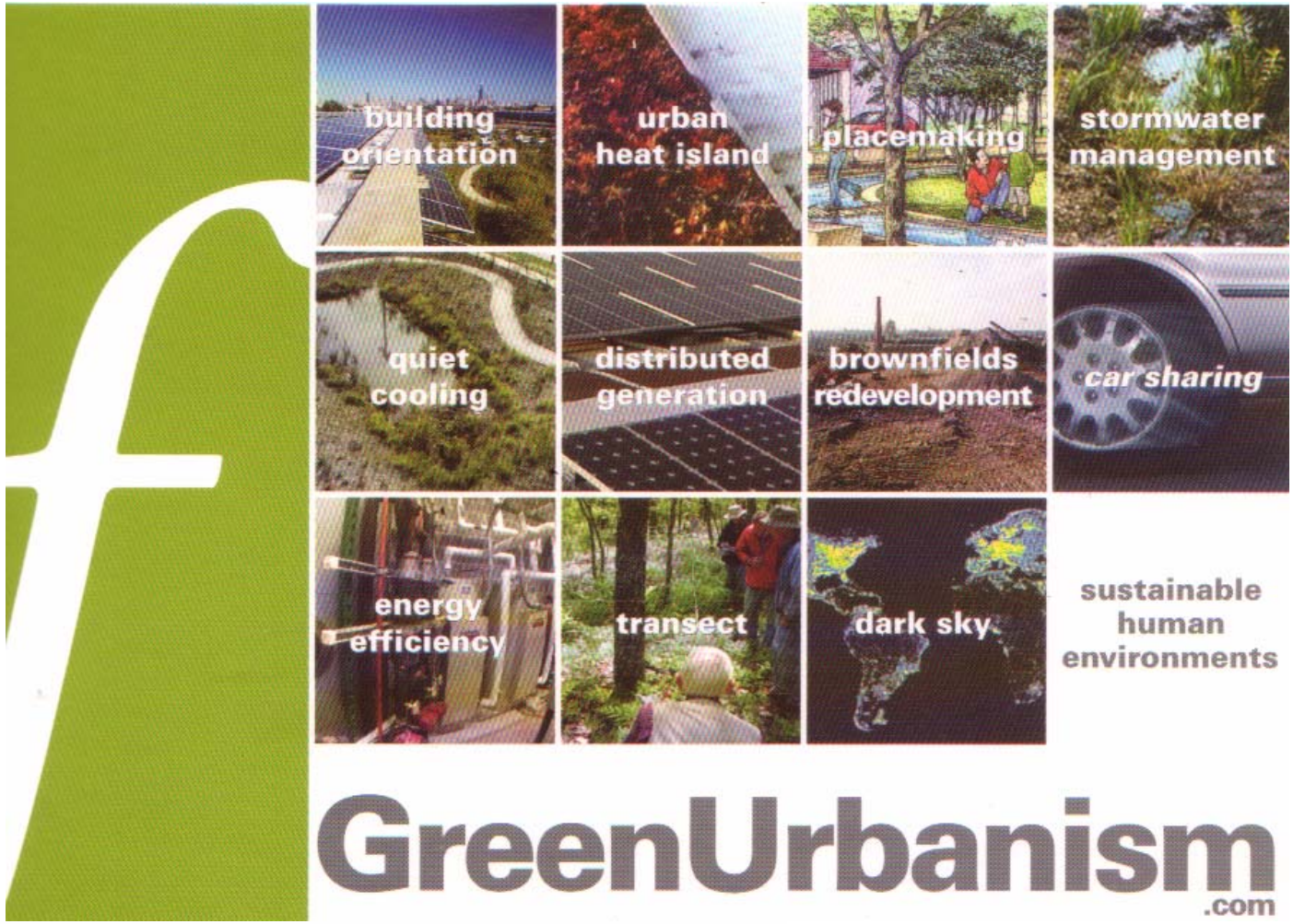
Likely Rating: 60%: Gold

What is Farr Associates doing?

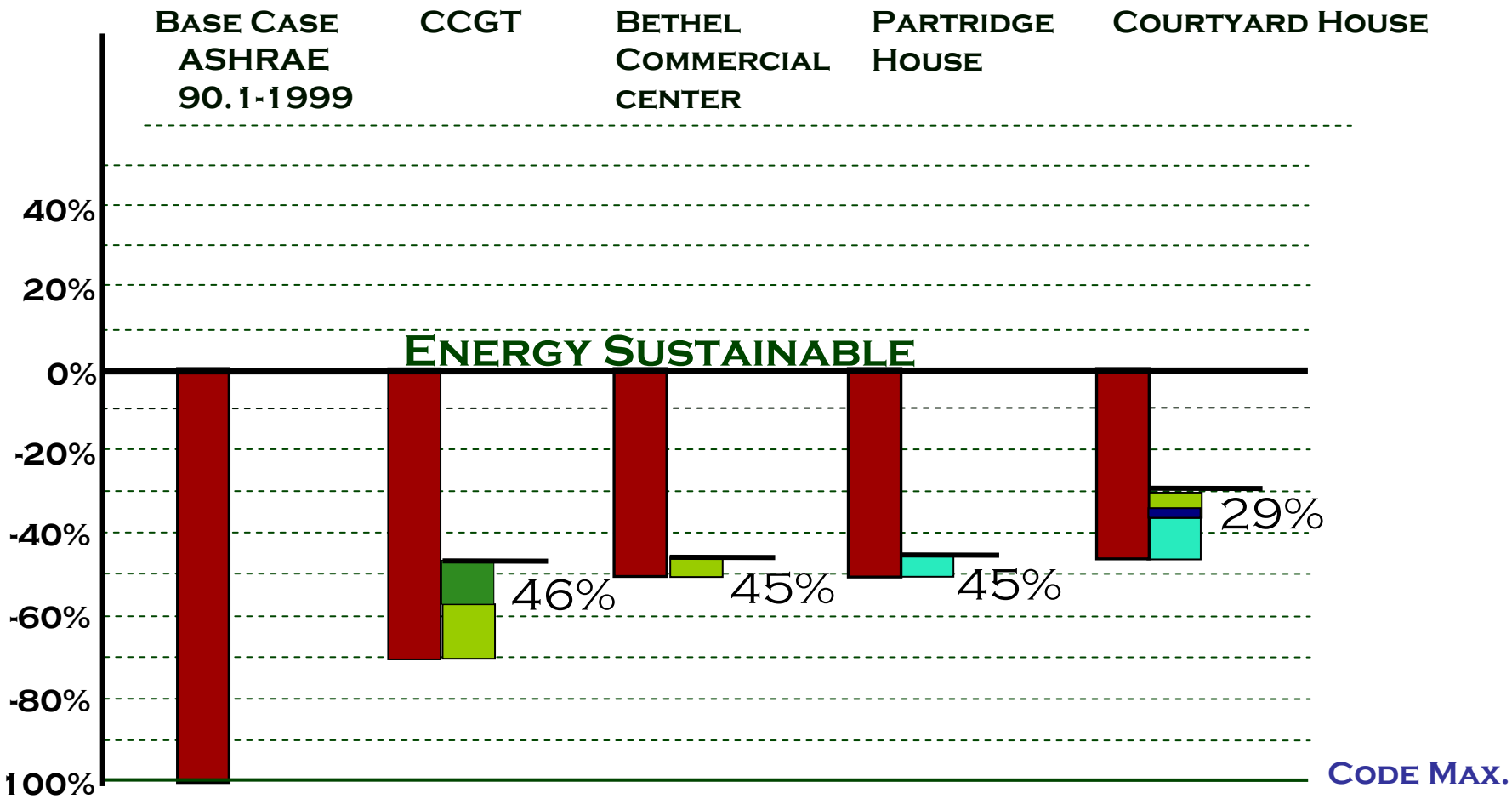
(5 minutes)

FARR ASSOCIATES
Architecture | Planning | Preservation

Green Urbanism



Building Energy Performance

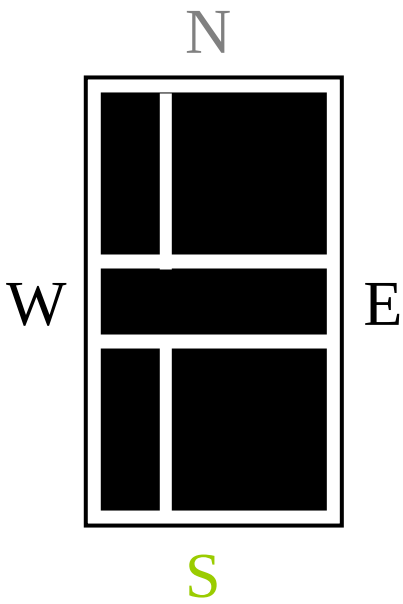


FARR ASSOCIATES
Architecture | Planning | Preservation

Orientation & Energy Cost

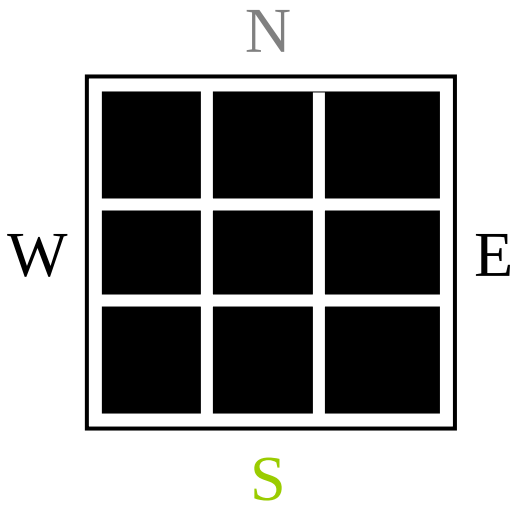
Based on Energy 10 Modeling of Building America Home

N-S= 1.5E-W



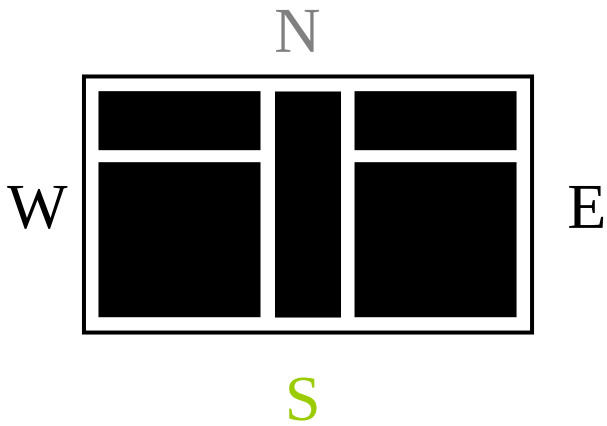
Base energy cost = 110%

N-S=E-W



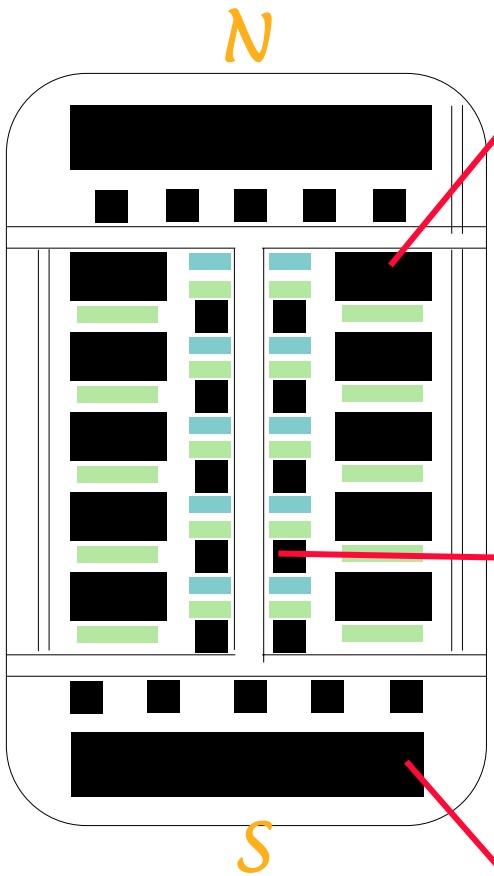
Base energy cost = 100%

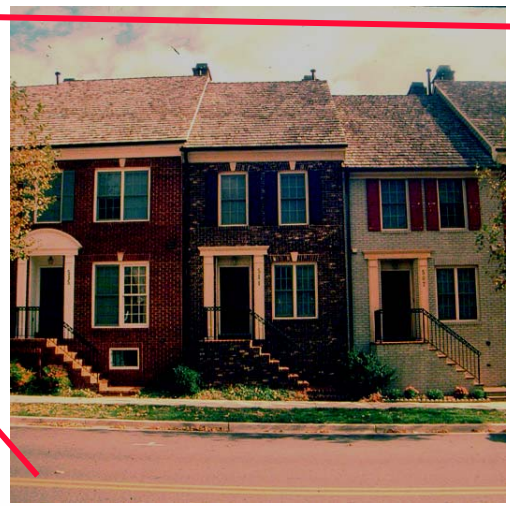
E-W = 1.5N-S



Base energy cost = 90%

Urban Design - Solar Block Studies





FARR ASSOCIATES
Architecture | Planning | Preservation

SOLAR BUILDING ORIENTATION

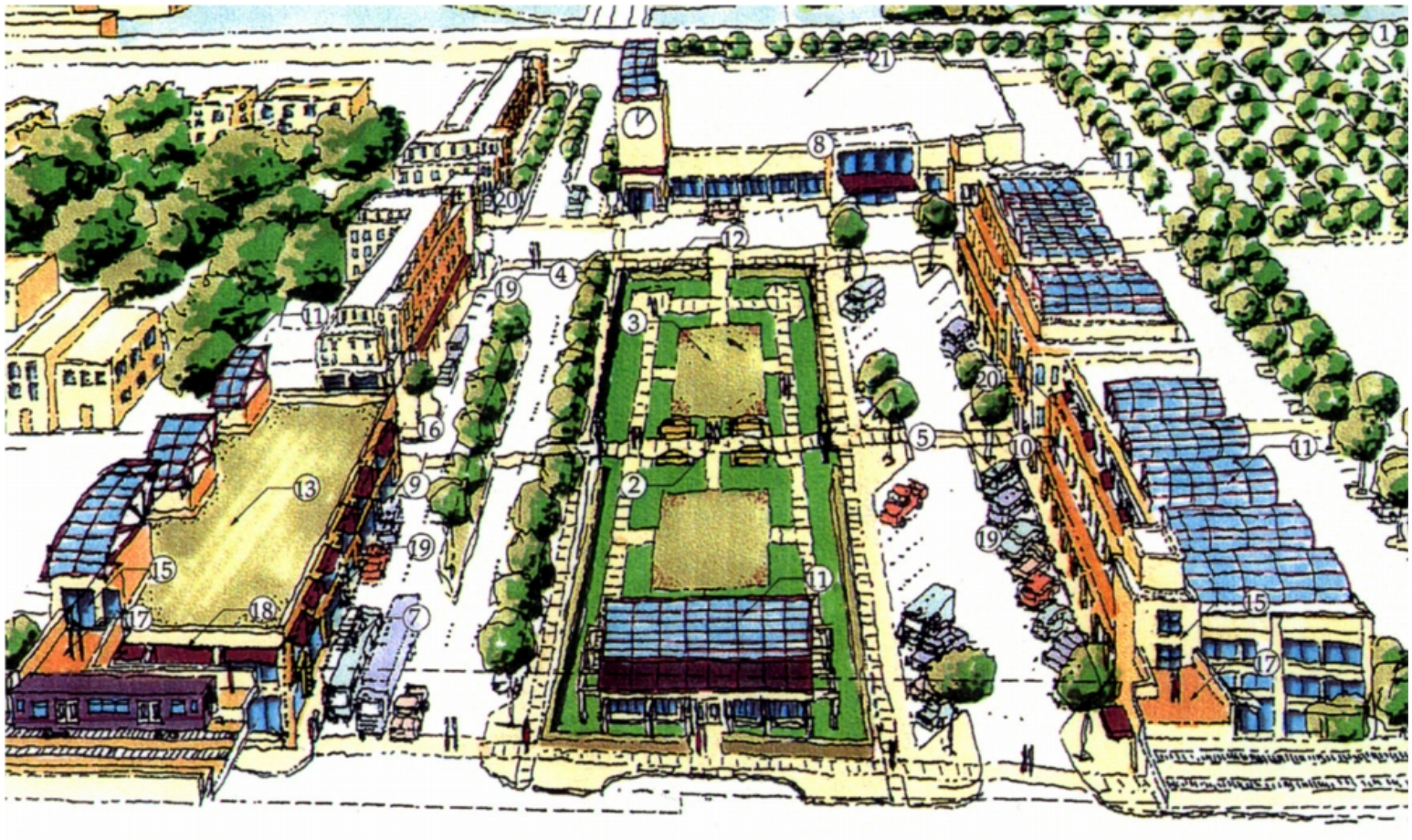
Green TOD

Station Area Redevelopment
Orland Park, IL

Shared Parking, Drainage Swales, Vegetated & Pv Roofs

FARR ASSOCIATES
Architecture | Planning | Preservation

Lake- Pulaski TOD



Chicago, Il

FARR ASSOCIATES
Architecture | Planning | Preservation

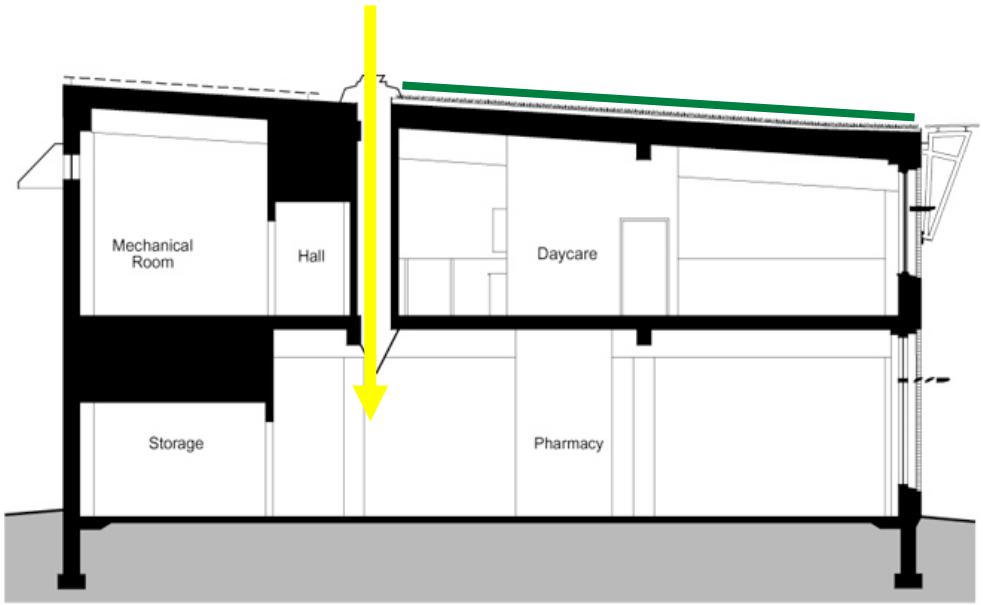
Bethel Commercial Center

PV Cornice, Light Shelves

FARR ASSOCIATES

Architecture | Planning | Preservation

Bethel Commercial Center



Building Section

PV Cornice

FARR ASSOCIATES
Architecture | Planning | Preservation

Green Urbanism

Master Plan for 150 Acre Site, 30% Open Space

FARR ASSOCIATES

Architecture | Planning | Preservation

Stormwater Street

Boulevard with Swale and Trees

FARR ASSOCIATES
Architecture | Planning | Preservation

Inspiration

Delft, Holland

FARR ASSOCIATES

Architecture | Planning | Preservation

Cultural Basis

Delft, Holland

Dunelands Village Hope VI

Miller, Indiana

17 DU/Net Acre, 200 year storm event on site

FARR ASSOCIATES

Architecture | Planning | Preservation

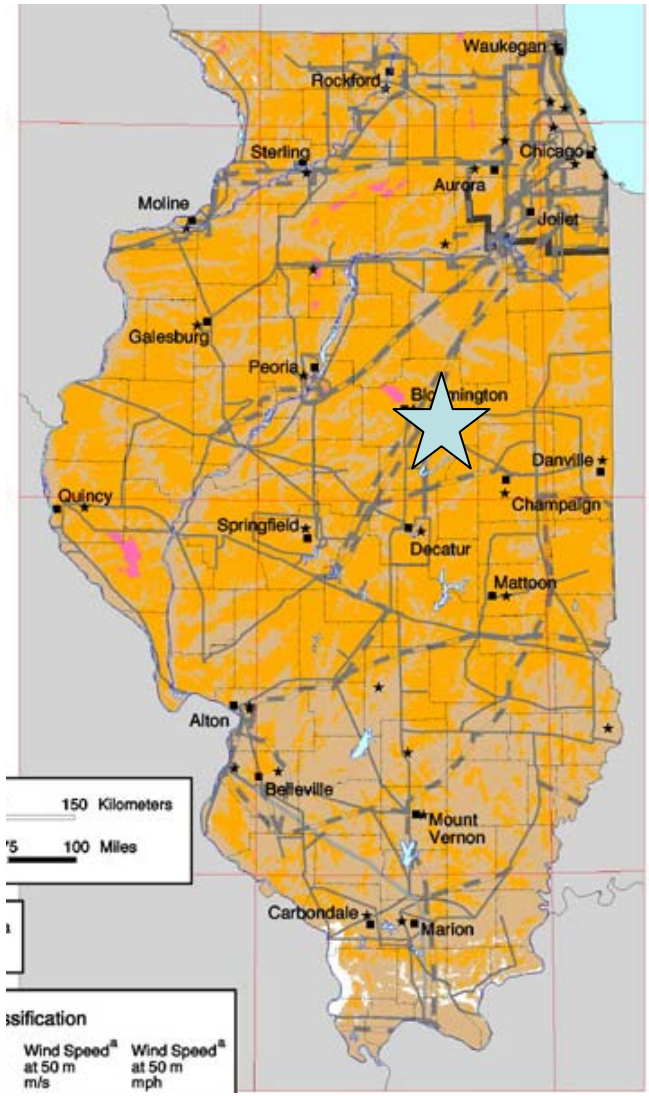
Dunelands Village

Block Scale Rain Gardens

FARR ASSOCIATES

Architecture | Planning | Preservation

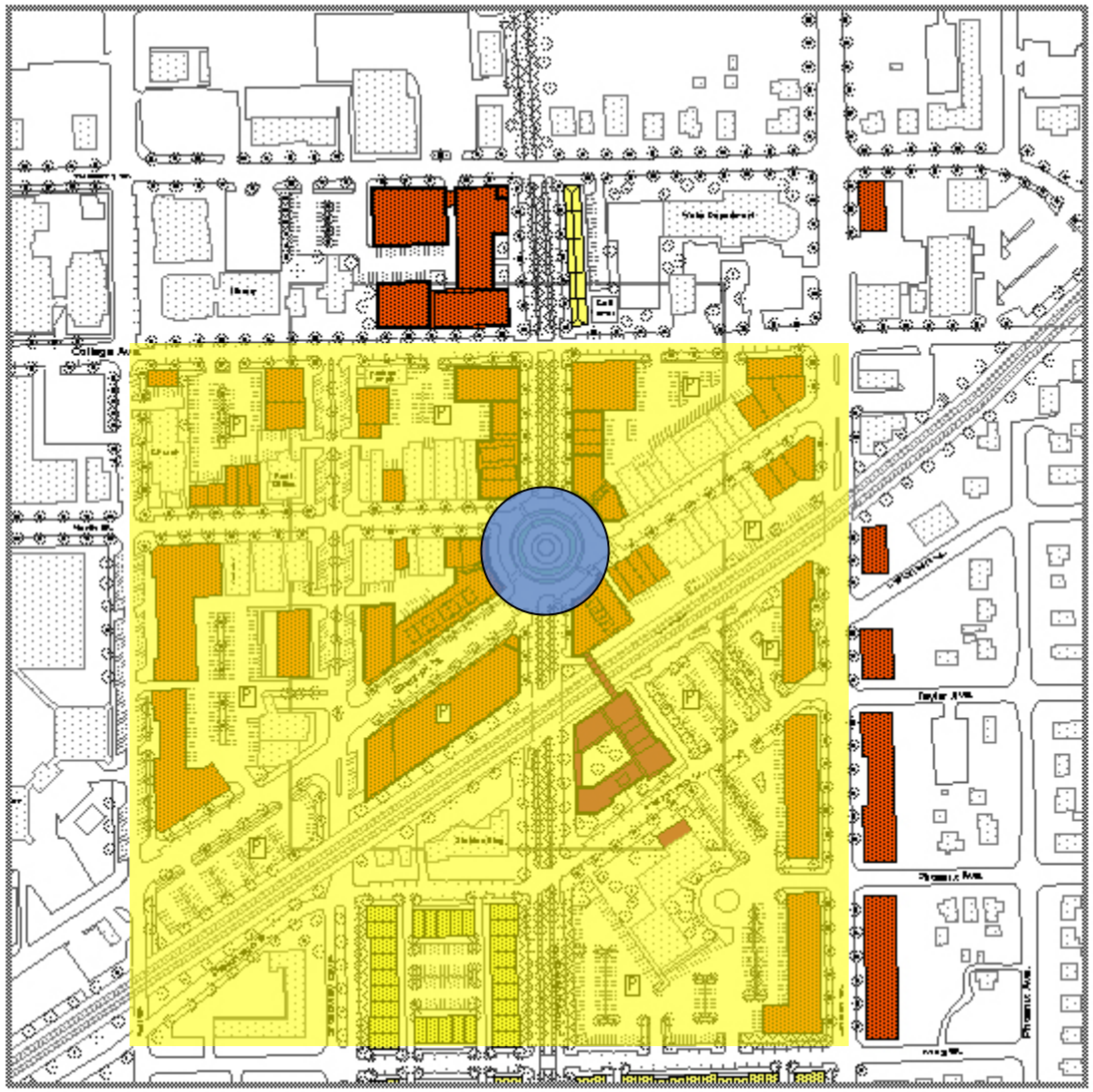
Normal, Illinois



FARR ASSOCIATES

Architecture | Planning | Preservation

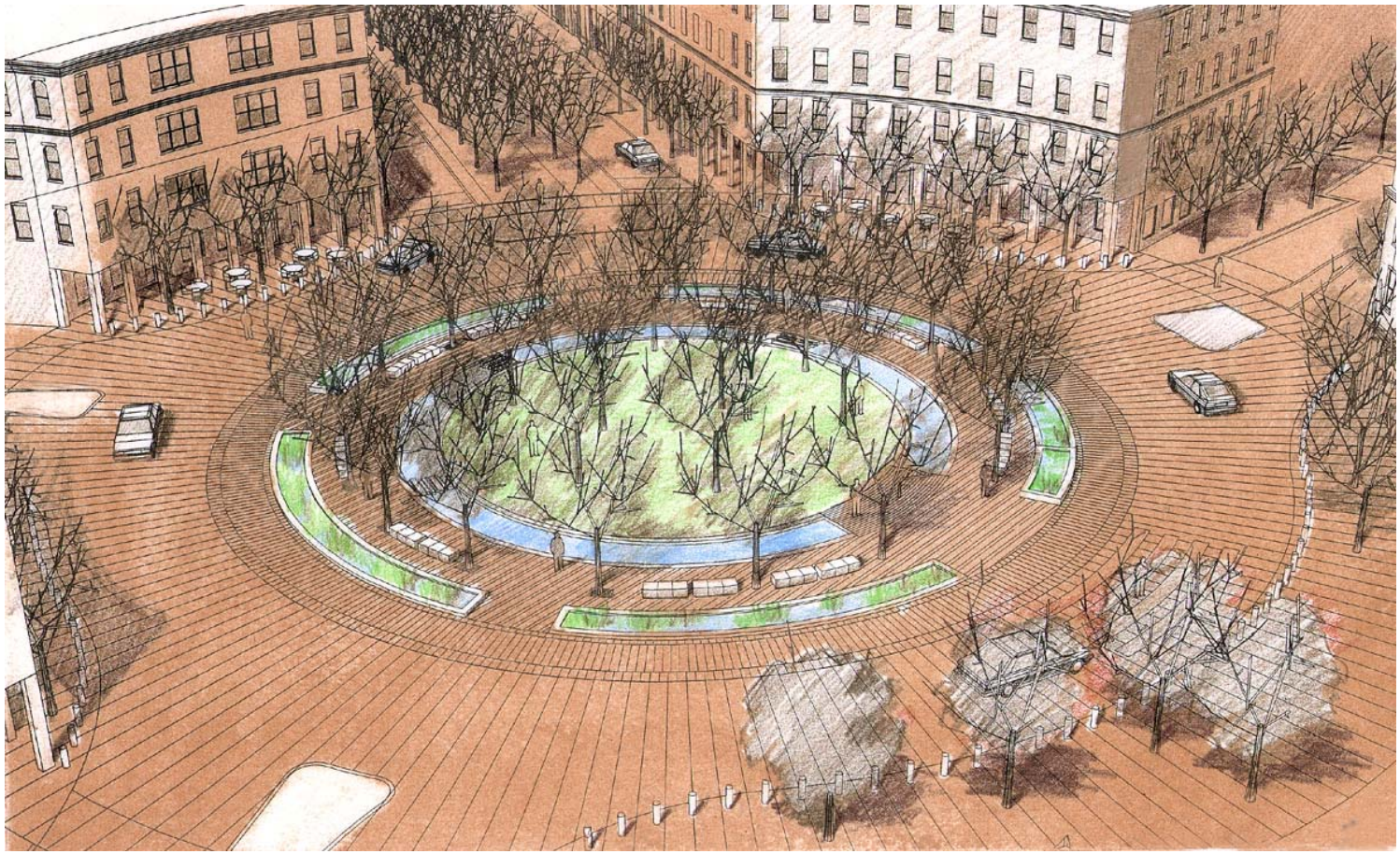
Downtown Master Plan



FARR ASSOCIATES

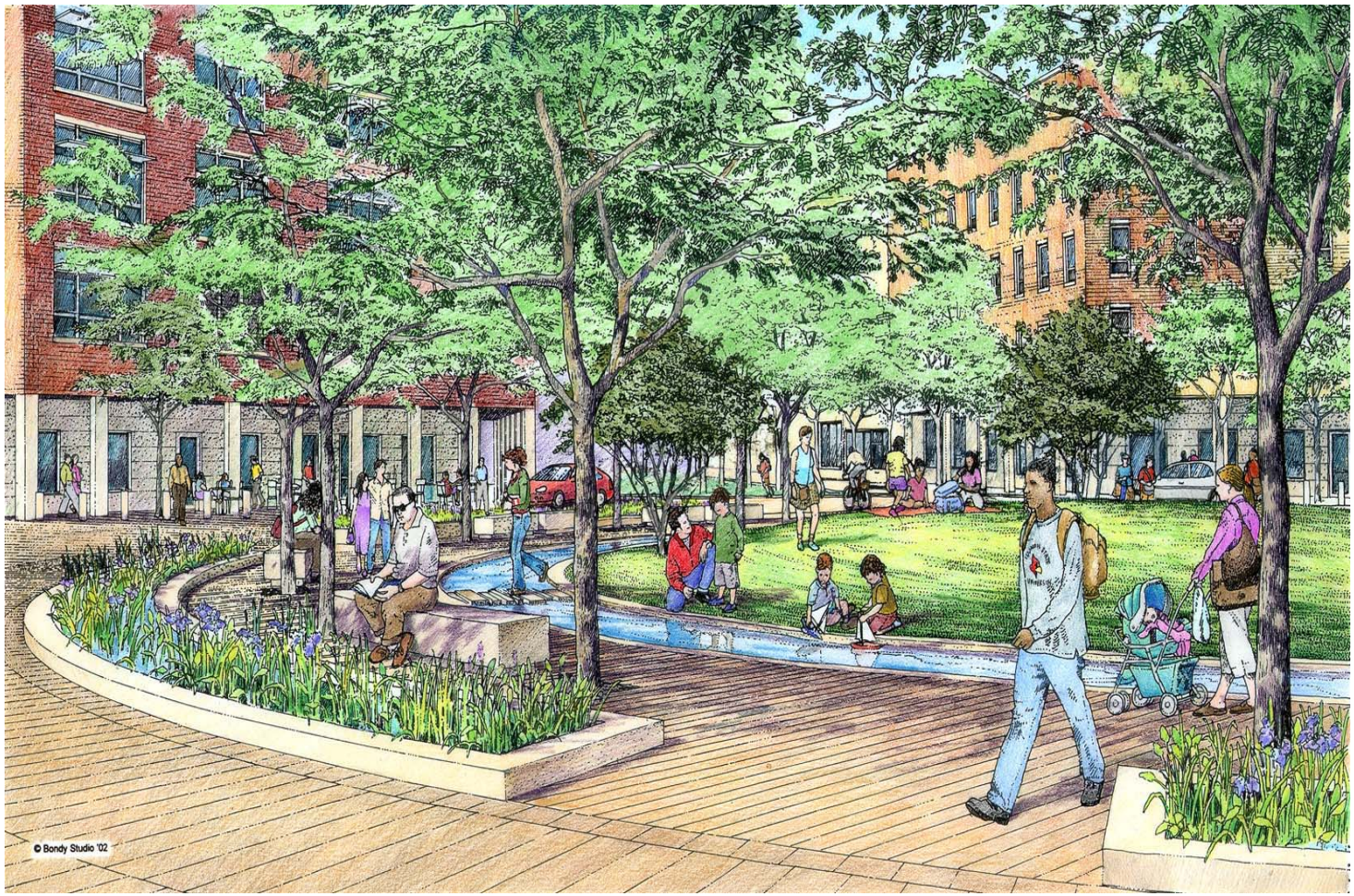
Architecture | Planning | Preservation

Normal, Illinois



FARR ASSOCIATES
Architecture | Planning | Preservation

Normal, Illinois



Celebrating Storm Water

Koln, Germany

FARR ASSOCIATES
Architecture | Planning | Preservation

Normal: Form-Based Coding

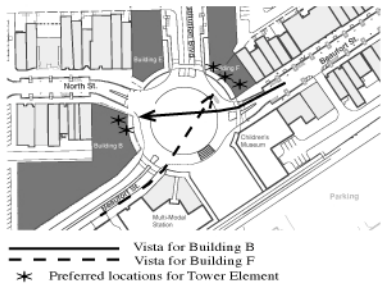
TOWER ELEMENT

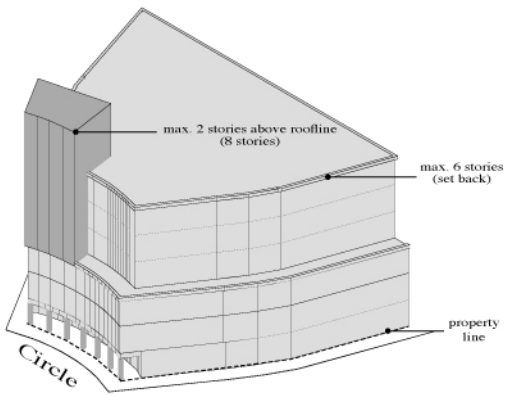
A tower element is permitted for street facades located on the Circle. If a tower is desired, the following guidelines apply.

Orientation
Tower may be oriented to the left, center, or right side of a street facade located on the Circle, based on the vista from the radial street opposite the building. When no vista is prominent, tower may be oriented to left, center, or right.

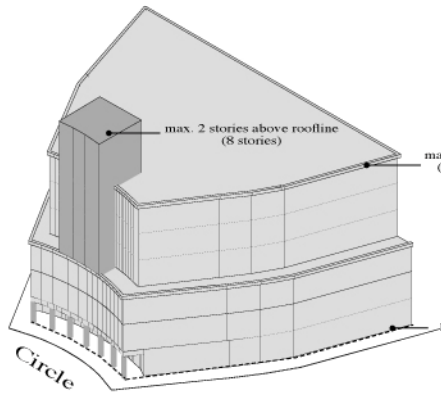
Dimensions
Tower may be a maximum of 30 feet wide and 30 feet deep.

Height
Tower may be a maximum of two stories above roofline, but no more than eight stories tall. Tower may not be located below the third story of a building.

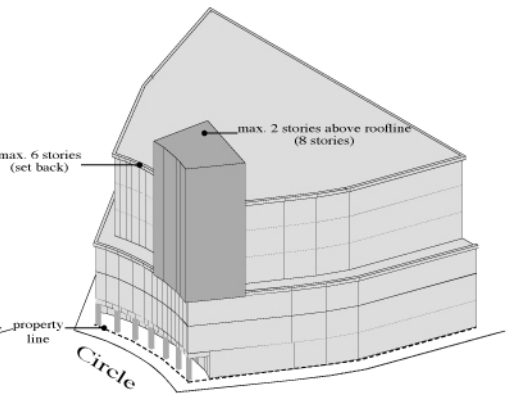




Left Orientation of Tower



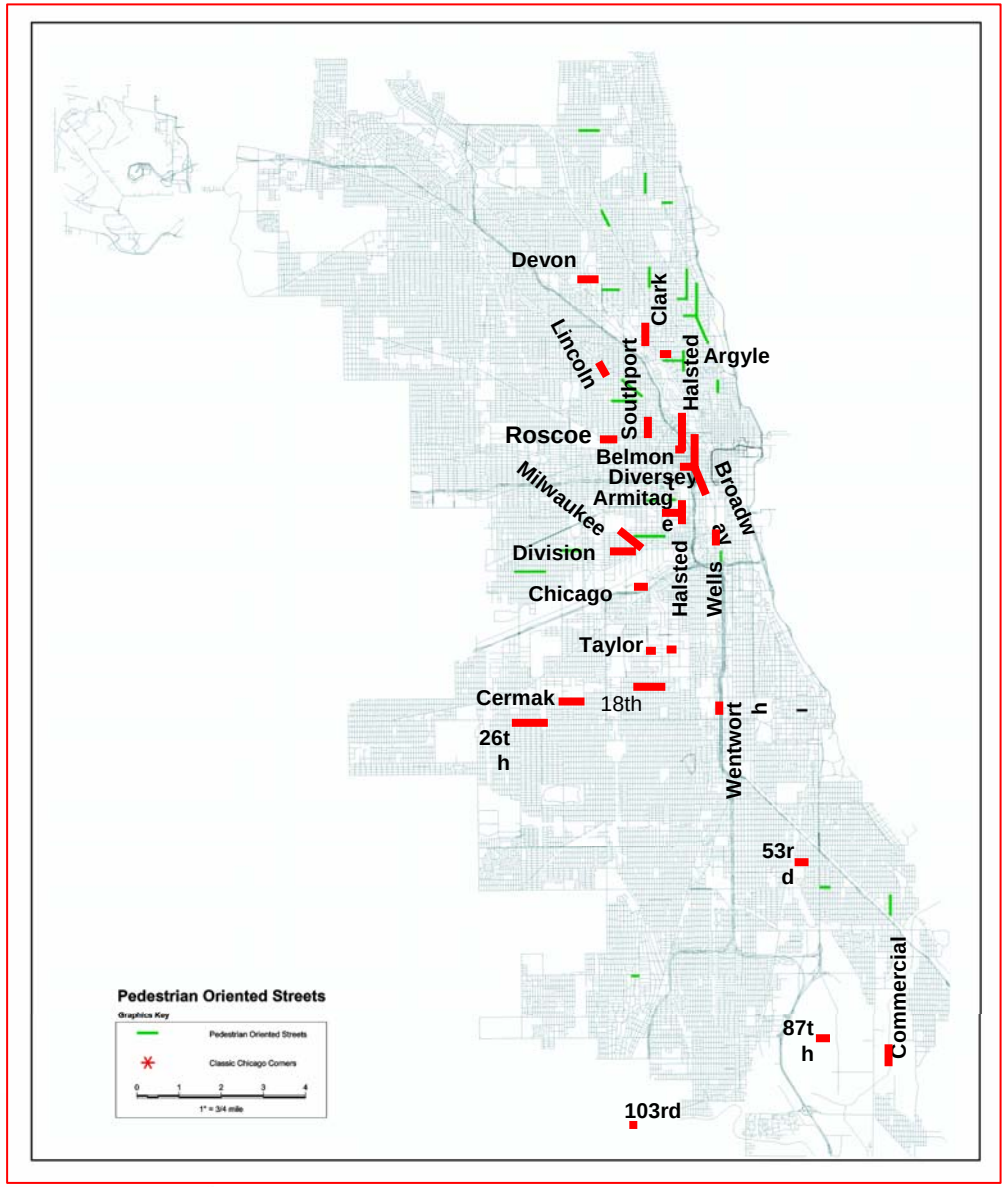
Center Orientation of Tower



Right Orientation of Tower

Sample Building: View from Circle
Orientation of tower may be to left, center, or right, depending on the vista; refer to plan, above.

- Pedestrian Oriented Streets to be Preserved
  - 26 Portions of Streets
  - Total Length: Approx. 12 Miles
- Classic Corners
  - 8 Intersections



FARR ASSOCIATES
Architecture | Planning | Preservation

No Building Setbacks Required

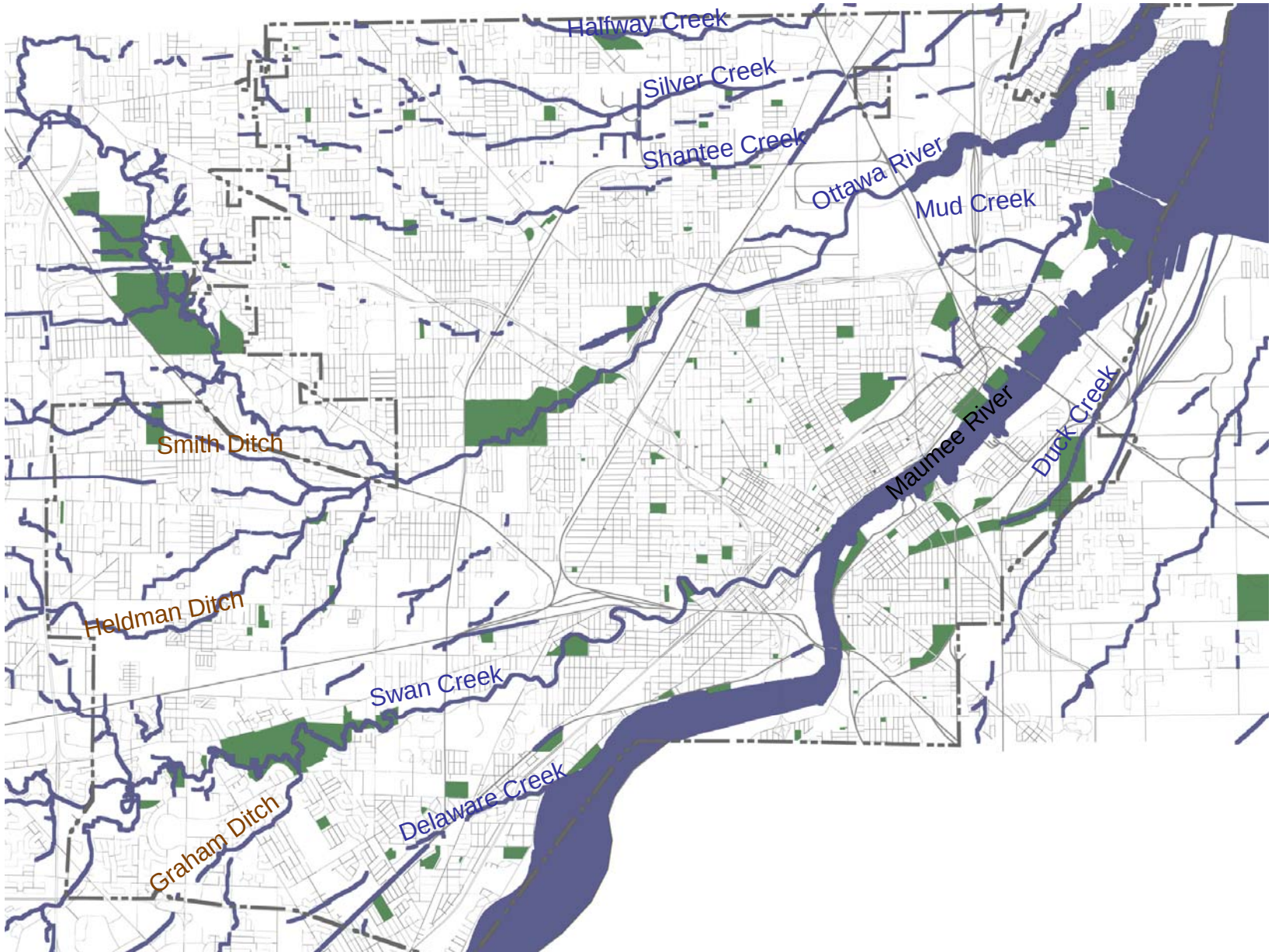
To create a continuous streetwall.

Windows along sidewalk

FARR ASSOCIATES
Architecture | Planning | Preservation

For transparent interesting facades.

Strength:
Intact Toledo Waterways and Parks



Or:

Toledo

Portland without the rain

FARR ASSOCIATES

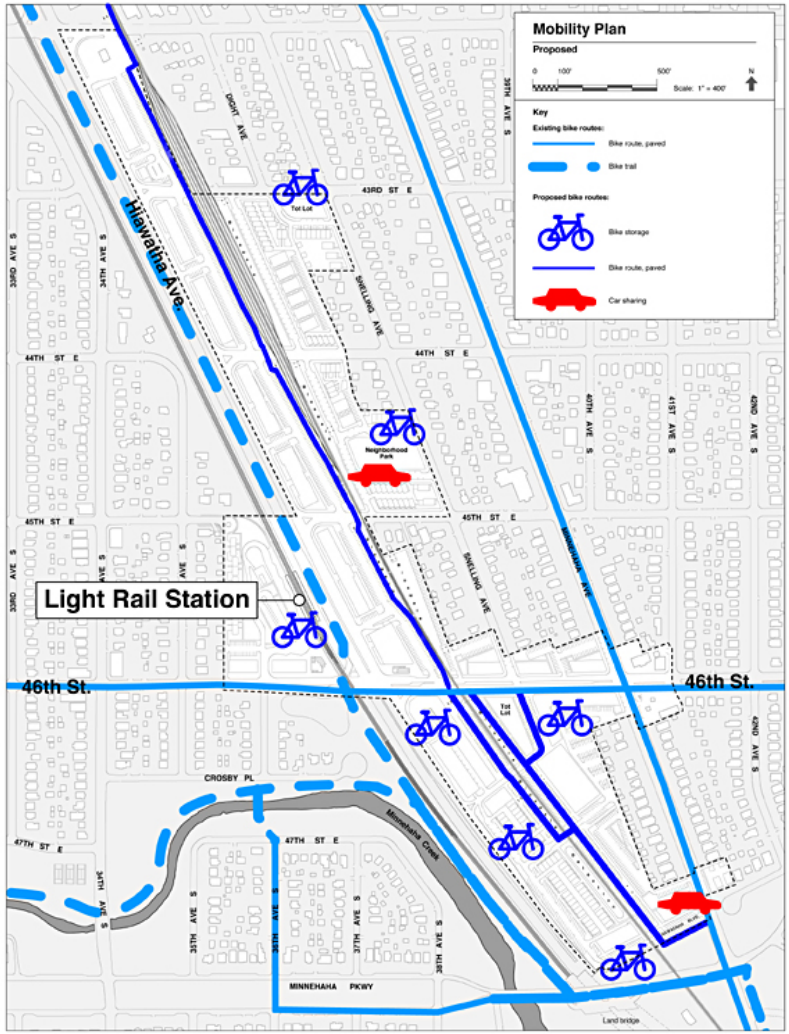
Architecture | Planning | Preservation

A Sustainable Human Habitat

QuickTime™ and a
Photo CD Decompressor
are needed to use this picture

FARR ASSOCIATES
Architecture | Planning | Preservation

Mobility plan



46th & Hiawatha - Minneapolis, MN.

FARR ASSOCIATES

Architecture | Planning | Preservation

Thank You

Visit farrside.com
Visit greenurbanism.com

To get ND draft, send an e-mail to:
nd@committees.usgbc.org

FARR ASSOCIATES
Architecture | Planning | Preservation

Top Ten Next Steps for Seattle

1. Pilot LEED-ND on redevelopment projects
   Adopt LEED-ND to guide metropolitan growth
   Help develop LEED-Existing Neighborhood
   Plan to improve neighborhood completeness
   Overcome barriers to using TIF
   Build storm water parks to celebrate H20
   Adopt form-based coding
   Exploit GASP-34 in municipal accounting
   Promote car-free living
   Invite me back for same weather next year

Recommended reading

The Tipping Point
The Long Emergency
An upcoming book by Farr Associates

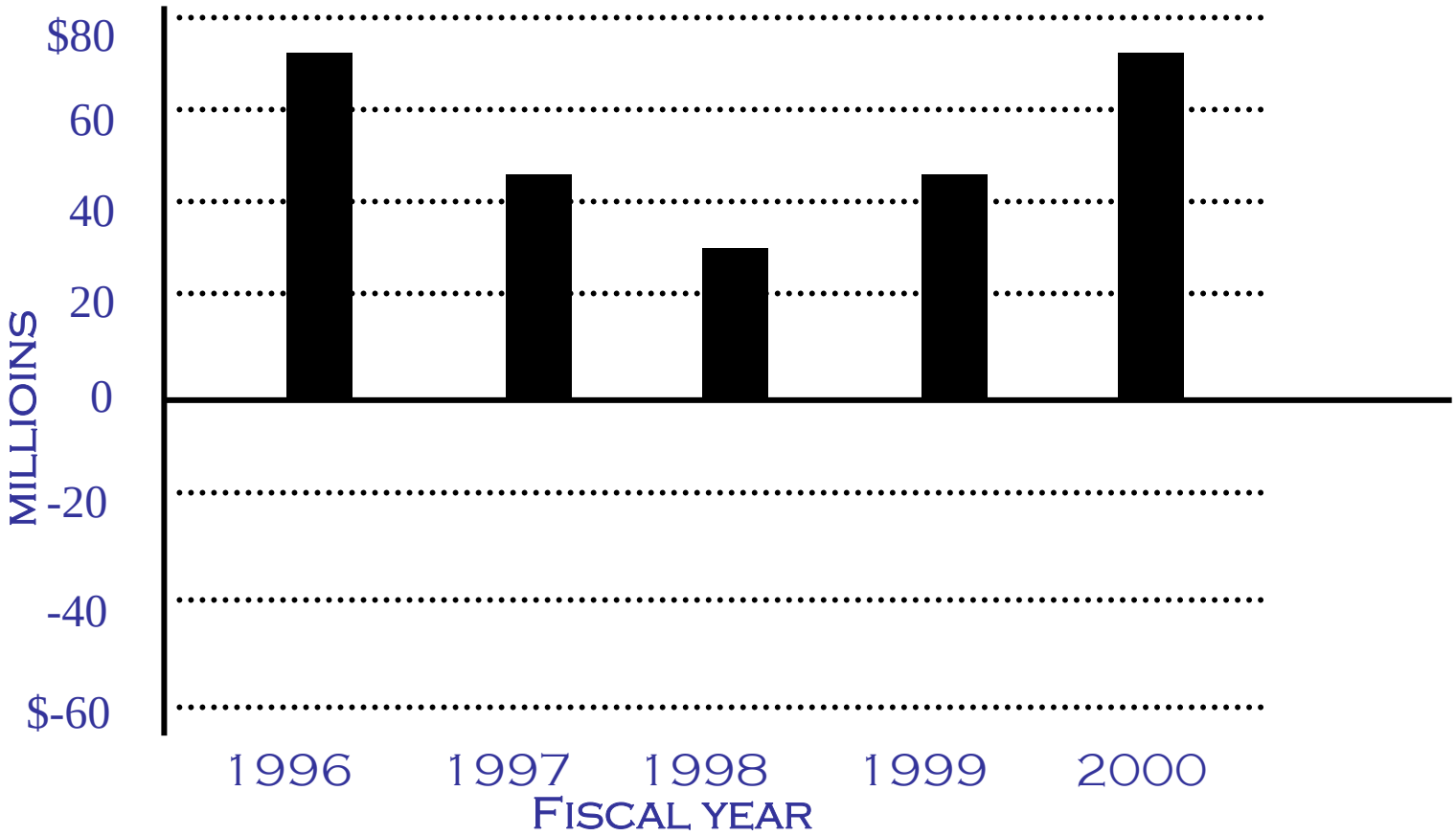
FARR ASSOCIATES
Architecture | Planning | Preservation

Why can’t a building be more like a tree?

FARR ASSOCIATES
Architecture | Planning | Preservation

EBSCO

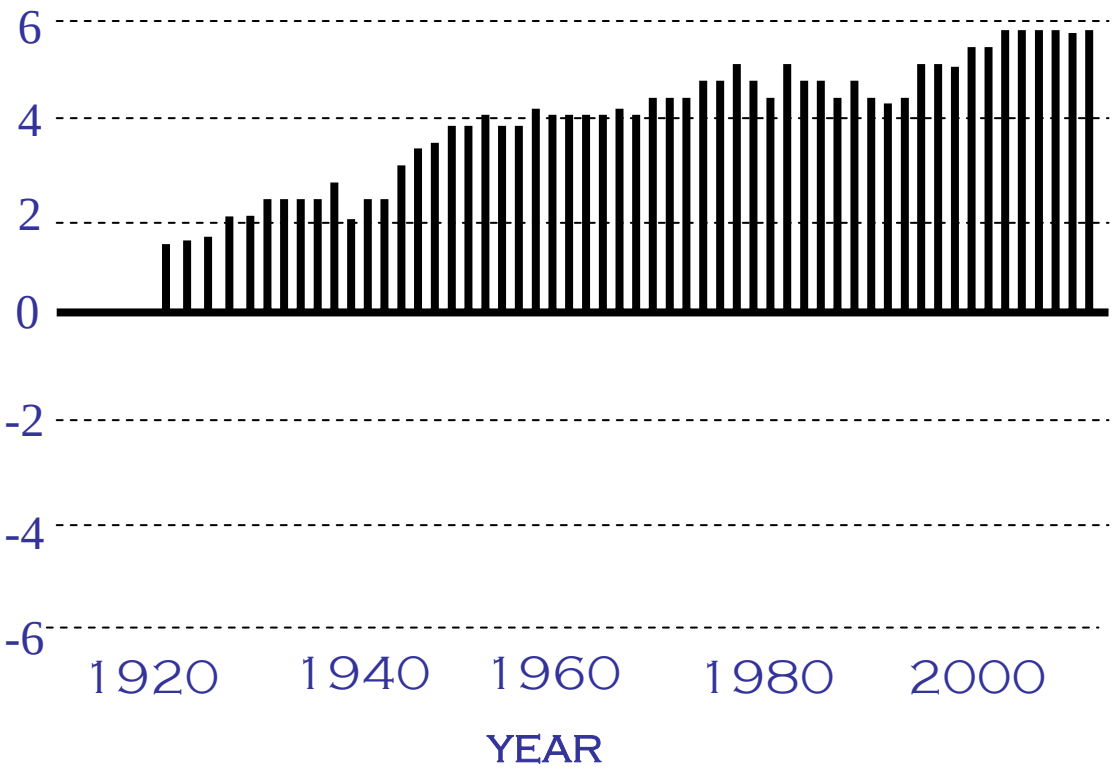
net income

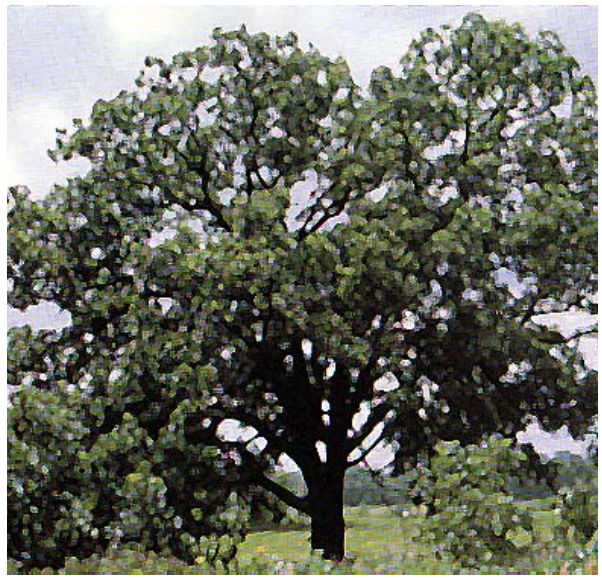


SOURCE: FORBES.COM

A Tree

Energy production/consumption



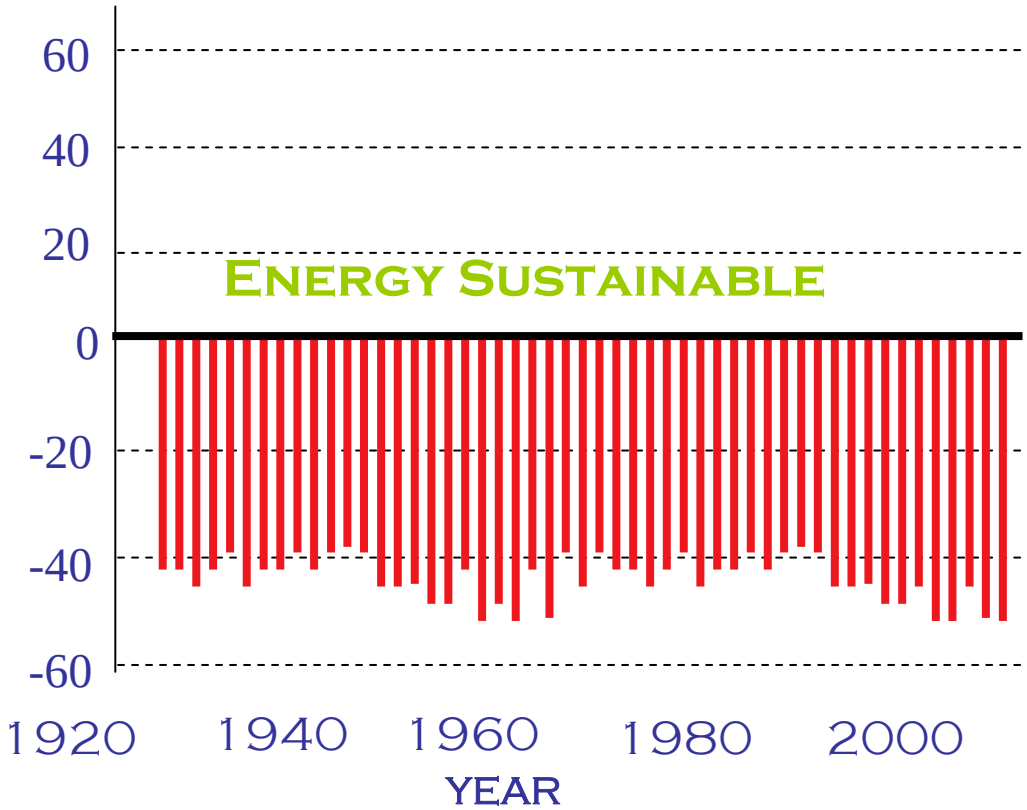


FARR ASSOCIATES

Architecture | Planning | Preservation

A Building

Energy production/consumption



FARR ASSOCIATES

Architecture | Planning | Preservation

Eco-Craftsman House

Prairie Crossing

FARR ASSOCIATES
Architecture | Planning | Preservation

Sustainability Leadership Certification for Existing Neighborhoods

An Approach for Downtown Indianapolis

FARR ASSOCIATES
Architecture | Planning | Preservation

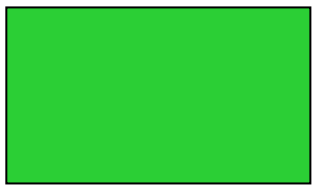
Green Buildings

FARR ASSOCIATES
Architecture | Planning | Preservation

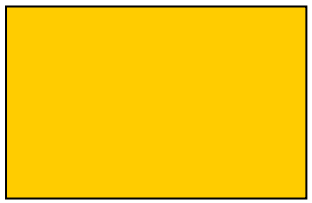
Continuous Pedestrian Network

FARR ASSOCIATES
Architecture | Planning | Preservation

PedZone[sm]



Pedestrian Rewarding



Pedestrian Unrewarding

Cars cross Pedestrian Path

FARR ASSOCIATES

Architecture | Planning | Preservation

Pedestrian Continuity

Pedestrian Friendly

Pedestrian Continuity

Pedestrian Friendly

Pedestrian Continuity

Pedestrian Unfriendly

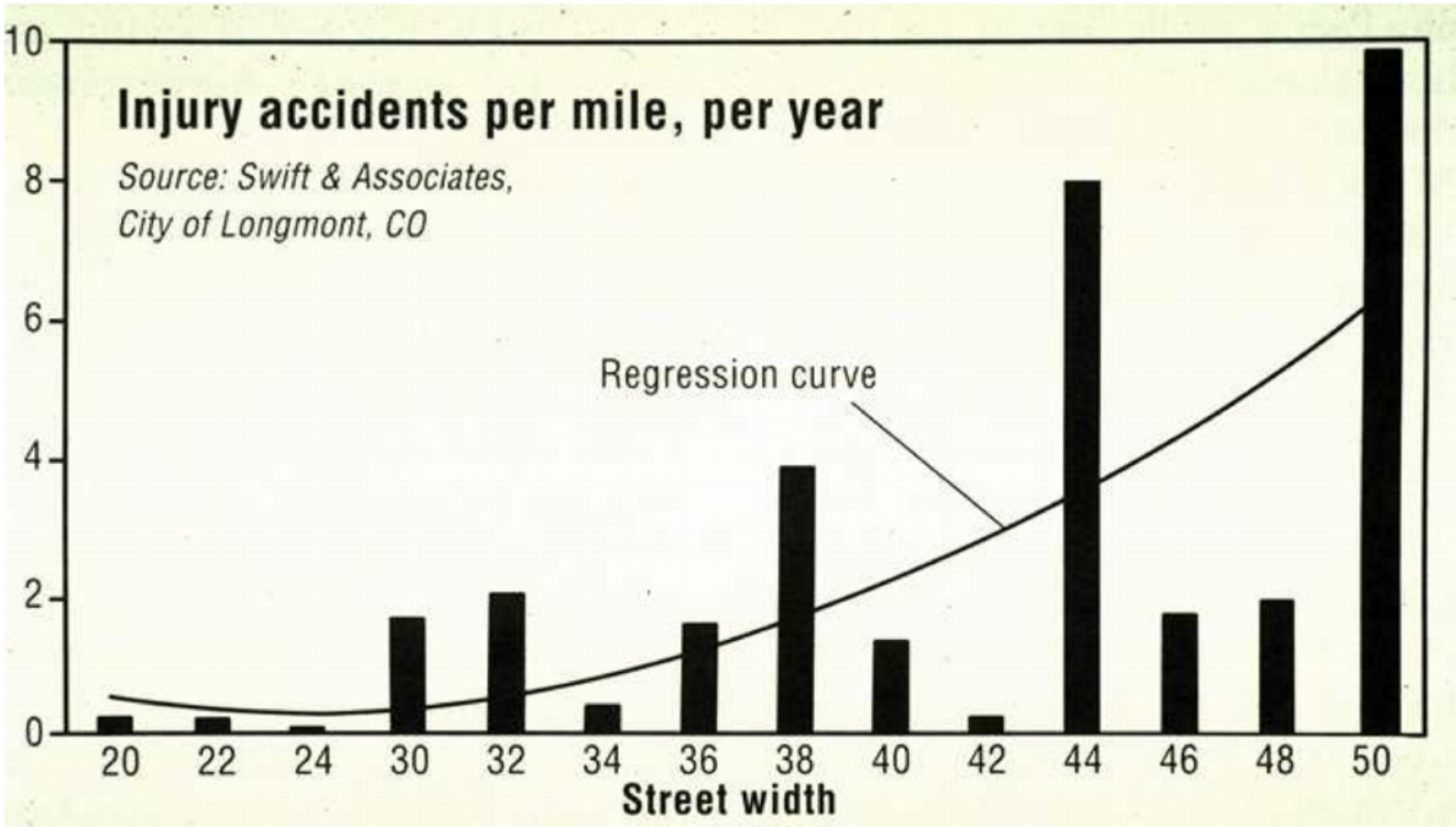
Pedestrian Continuity

Pedestrian Unfriendly

Cool & Safe Streets

FARR ASSOCIATES
Architecture | Planning | Preservation

Skinny Streets



Source: New Urban News

Streets - Medians

Context Sensitive Design

FARR ASSOCIATES

Architecture | Planning | Preservation

Night Sky Lighting

FARR ASSOCIATES
Architecture | Planning | Preservation

Night Sky Pollution

A Green Building Critique of New Urbanism

View from Sears Tower

2003 Blackout?

Public Lighting

2 - 6 foot candles Milwaukee, Wi

Uniform Public Lighting

Source: clanton associates

Sidewalk Lighting

New York, New York

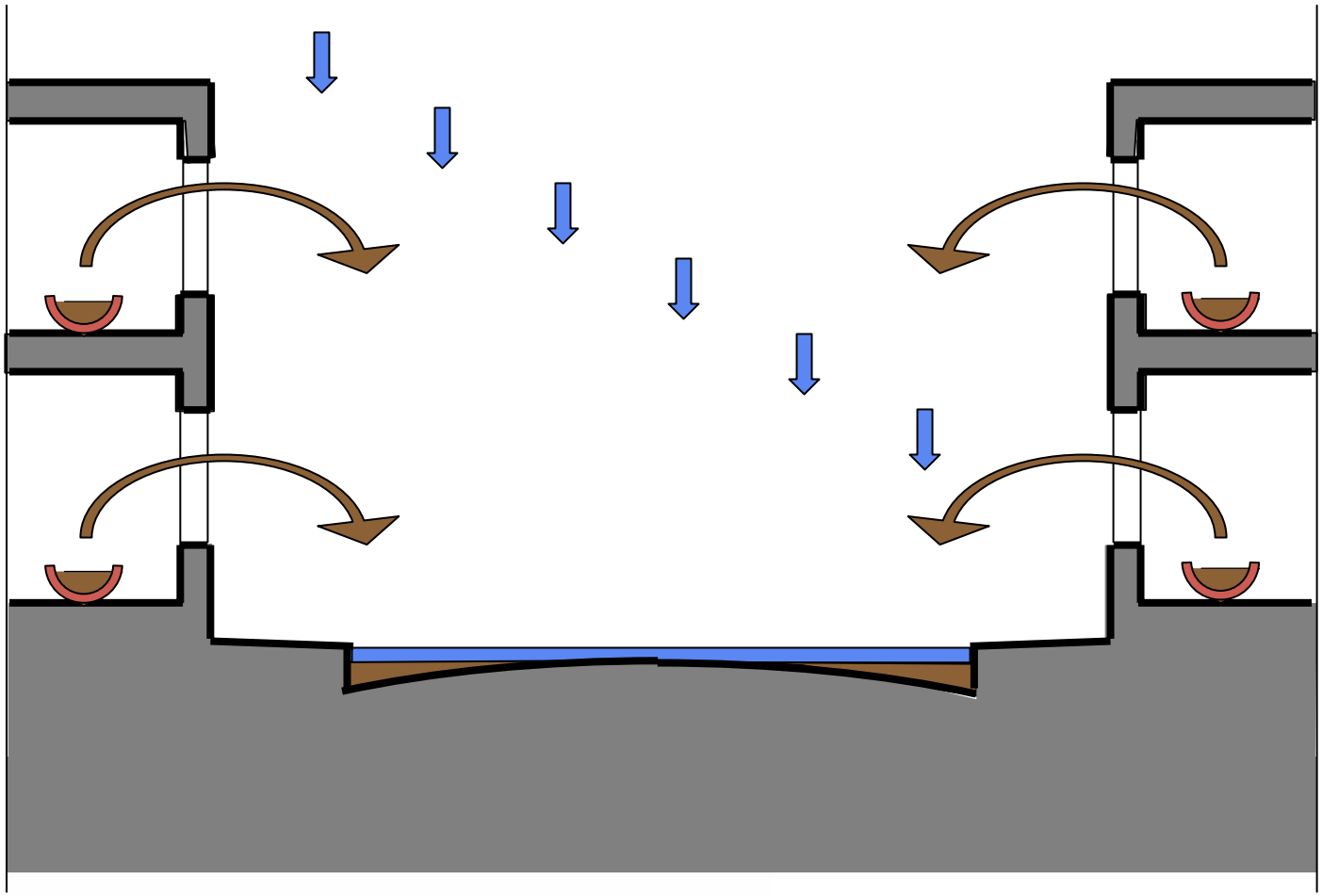
FARR ASSOCIATES

Architecture | Planning | Preservation

Green Infrastructure

FARR ASSOCIATES
Architecture | Planning | Preservation

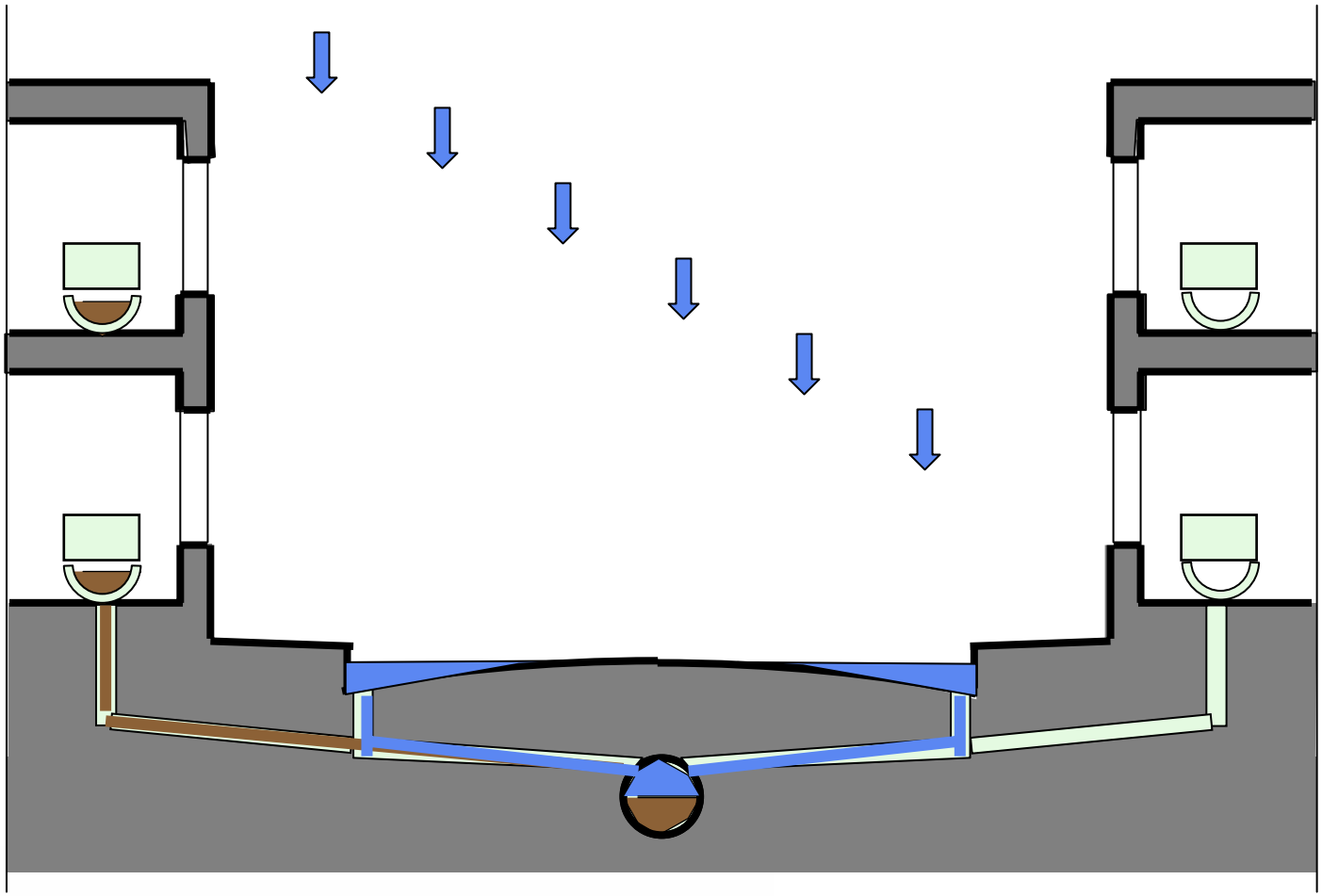
Ancient Greek or Roman Street



FARR ASSOCIATES
Architecture | Planning | Preservation

Traditional American Street

20th C. Combined Sewer



Father of the Clean Water Act

Pervious Pavers

FARR ASSOCIATES
Architecture | Planning | Preservation

Enhanced Mobility

FARR ASSOCIATES
Architecture | Planning | Preservation

Car Sharing in Downtown Indianapolis

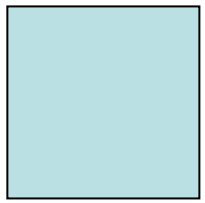
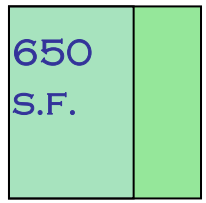
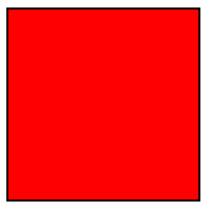
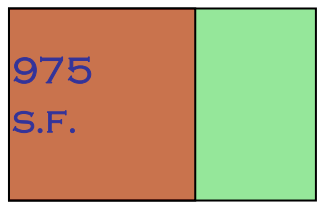
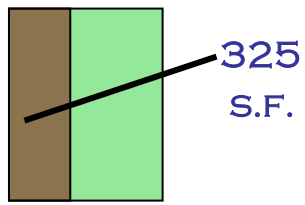
FARR ASSOCIATES
Architecture | Planning | Preservation

Thank You

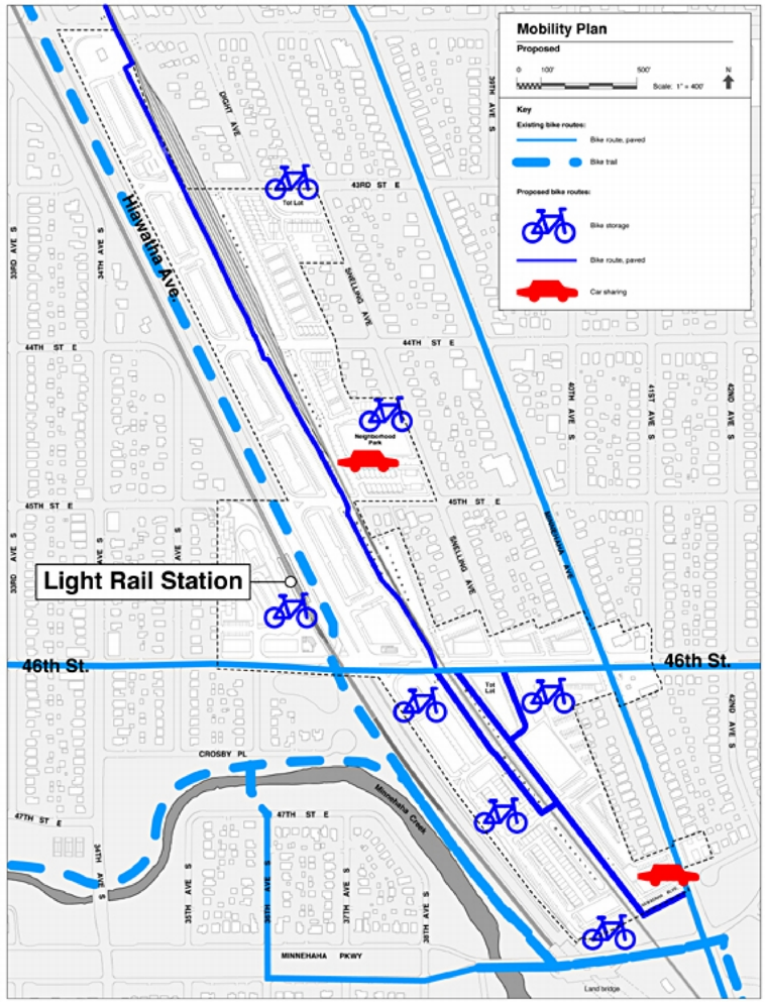
Visit farrside.com
Visit greenurbanism.com

FARR ASSOCIATES
Architecture | Planning | Preservation

TOD Parking reduction

	Building (1000 s.f.)	parking range	Paved Parking minimum (space and lanes)
Office		2 - 4 spaces/ 1000 s.f.	
Retail		3 - 5 spaces/ 1000 s.f.	
Light industrial		1 - 3 spaces/ 1000 s.f.	

Mobility plan



46th & Hiawatha - Minneapolis, MN.

FARR ASSOCIATES

Architecture | Planning | Preservation